

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

200936USPCT

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/719554

INTERNATIONAL APPLICATION NO.

PCT/FR99/01513

INTERNATIONAL FILING DATE

23 JUNE 1999

PRIORITY DATE CLAIMED

23 JUNE 1998

TITLE OF INVENTION

NUCLEIC SEQUENCE AND DEDUCED PROTEIN SEQUENCE FAMILY WITH HUMAN ENDOGENOUS
RETROVIRAL MOTIFS, AND THEIR USES

APPLICANT(S) FOR DO/EO/US

Patric M. ALLIEL, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Request for Consideration of Documents Cited in International Search Report

Notice of Priority

PCT/IB/304

PCT/IB/308

Drawings (64 Sheets)

Sequence Listing (84 Sheets)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/719554

INTERNATIONAL APPLICATION NO.

PCT/FR99/01513

ATTORNEY'S DOCKET NUMBER

200936US0PCT

21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **\$1,000.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **\$860.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$710.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$690.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =**\$860.00**

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$130.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	37 - 20 =	17	x \$18.00	\$306.00
Independent claims	6 - 3 =	3	x \$80.00	\$240.00
Multiple Dependent Claims (check if applicable).				<input type="checkbox"/> \$0.00

TOTAL OF ABOVE CALCULATIONS =**\$1,536.00**

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).

☐ **\$0.00****SUBTOTAL =****\$1,536.00**

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

☐ **\$0.00****TOTAL NATIONAL FEE =****\$1,536.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).

☐ **\$0.00****TOTAL FEES ENCLOSED =****\$1,536.00**

Amount to be:
refunded \$
charged \$

- ☒ A check in the amount of **\$1,536.00** to cover the above fees is enclosed.
- ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- ☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **15-0030** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

**22850**

Surinder Sachar
Registrar, No. 84,423

SIGNATURE

Norman F. Oblon

NAME

24,618

REGISTRATION NUMBER

DATE

Dec. 26 2000

PTO/PCT Rec'd 02 JUL 2001

#4

200936US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
PATRICK ALLIEL ET AL : ATTN: APPLICATION DIVISION
SERIAL NO: 09/719,554 :
FILED: December 26, 2000 :
FOR: NUCLEIC SEQUENCE AND :
DEDUCED PROTEIN SEQUENCE :
FAMILY WITH HUMAN :
ENDOGENOUS RETROVIRAL :
MOTIFS, AND THEIR USES :

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

In response to the Office Communication mailed April 30, 2001, Applicants submit herewith a substitute Sequence Listing and a corresponding computer-readable Sequence Listing. Prior to examination on the merits, please amend the above-identified application as follows.

IN THE SPECIFICATION

Please amend the specification as follows:

Page 69 (Abstract), after the last line, beginning on a new page, please delete the original Sequence Listing and replace with the substitute Sequence Listing appended herewith.

09/719,554

REMARKS

Claims 1-37 are active in the present application. Applicants have now submitted a substitute Sequence Listing and a corresponding computer-readable Sequence Listing. The sequence information recorded in the corresponding computer-readable Sequence Listing is identical to the paper copy of the substitute Sequence Listing. Support for all of the sequences listed in the substitute Sequence Listing is found in the present application as originally filed. No new matter is believed to have been introduced by the submission of the substitute Sequence Listing and the corresponding computer-readable Sequence Listing.

Applicants submit that the present application is ready for examination on the merits. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Daniel J. Pereira, Ph.D.
Registration No. 45,518



22850

(703) 413-3000
Fax #: (703) 413-2220
NFO/DJP/law

H:\200936-pr.wpd

200936US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
PATRICK M. ALLIEL ET AL : ATTN: APPLICATION DIVISION
SERIAL NO: NEW PCT APPLICATION :
(Based on PCT/FR00/01513)
FILED: HEREWITH :
FOR: NUCLEIC SEQUENCE AND :
DEDUCED PROTEIN SEQUENCE
FAMILY WITH HUMAN
ENDOGENOUS RETROVIRAL
MOTIFS, AND THEIR USES

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

3. (Amended) A nucleic acid fragment, characterized in that it comprises a segment of a sequence as claimed in claim 1 [or claim 2] and in particular the sequence SEQ ID NO: 3-22, 28 and 61, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences as well as fragments derived from the coding

regions of the preceding sequences corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences.

4. (Amended) Transcripts, characterized in that they are generated from the sequences as claimed in [any one of claims 1 to 3] claim 1.

5. (Amended) A diagnostic reagent for the differential detection of complete or partial human endogenous nucleic sequences, having retroviral motifs, selected from the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2, characterized in that it is selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate label.

10. (Amended) A method for the rapid and differential detection of the endogenous retroviral nucleic sequences of the *env* or *env* and *gag* type, their normal or pathological variants, by hybridization and/or gene amplification, carried out using a biological sample, which method is characterized in that it comprises:

(a) a step in which a biological sample to be analyzed is brought into contact with at least one probe as claimed in claim 5[, claim 6 or claim 8,] and

(b) a step in which the product(s) resulting from the nucleotide sequence-probe interaction is detected by any appropriate means.

11. (Amended) The method of detection as claimed in claim 10, characterized in that it comprises:

- prior to step (a):
- a step of preparing the relevant biological tissue or fluid,
- a step of extracting the nucleic acid to be detected, and
- at least one gene amplification cycle carried out with the aid of at least one reagent [as claimed in any one of claims 5 to 7] selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate label, and subsequent to step (b):

- a step of comparing the nucleic sequences obtained in the said biological sample with the human endogenous retroviral sequences SEQ ID NO: 1 or SEQ ID NO:2 or to a sequence exhibiting a level of homology with SEQ ID NO: 1 or SEQ ID NO:2 greater than or equal to 80% on more than 190 nucleotides or greater than or equal to 70% on more than 600 nucleotides for the *env*-type domains [as claimed in any one of claims 1 to 3], by any appropriate means and in particular by sequencing, Southern blotting, restriction cleavage, SSCP or any other method which makes it possible to identify an insertion or a deletion or a single mutation between the various sequences compared.

12. (Amended) A method of detecting the transcripts as claimed in claim 4, characterized in that it comprises:

- collecting messenger RNAs obtained from control biological samples and from a similar sample collected from patients, and

TOBETTO-1556740

- the qualitative and/or quantitative analysis of the said mRNAs by *in situ* hybridization, by dot-blot, Northern blotting, RNase mapping or RT-PCR, with the aid of a diagnostic reagent selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate label [as claimed in any one of claims 5 to 9].

13. (Amended) Chimeric sequences, characterized in that they consist of a fragment of 17 to 40 nucleotides of a flanking sequence selected from the group consisting of transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/deregulation of motifs belonging to said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of the said HERV-7q family and in which one of the ends cannot be at a distance exceeding 120 kb, associated with an endogenous retroviral motif of the HERV-7q type comprising between 17 and 40 nucleotides as claimed in [claims 1 to 4] claim 1.

14. (Amended) A method for the detection and/or evaluation of an overexpression/underexpression or of a modification of at least one of the endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or of their associated flanking sequences, wherein the sequence are SEQ ID NO: 1 or SEQ ID NO:2 or

to a sequence exhibiting a level of homology with SEQ ID NO: 1 or SEQ ID NO:2 greater than or equal to 80% on more than 190 nucleotides or greater than or equal to 70% on more than 600 nucleotides for the *env*-type domains [as claimed in any one of claims 1 to 9], characterized in that it comprises:

- depositing on an appropriate support, cDNA obtained from clones, PCR products obtained from genomic DNA, RT-PCR products obtained from transcripts or from specific oligonucleotide sequences, the said DNA sequences being endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or their flanking sequences, consisting of transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/ deregulation of motifs belonging to the said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of the said HERV-7q family and in which one of the ends cannot be at a distance exceeding 120 kb, and/or a chimeric sequence as claimed in claim 13,

- the hybridization of the said support with at least one appropriately labeled probe obtained, for example, by retrotransposition of an RNA mixture obtained from biological cells, tissues or fluids obtained from controls reputed to be normal, from members of various ethnic populations, from patients suffering from pathological conditions often associated with expression of retroviruses, such as tumor processes, or such as autoimmune diseases, and

- the detection of the hybrids formed.

16. (Amended) The method as claimed in claim 14 [or claim 15], characterized in that the said support comprises, in addition, any endogenous or exogenous retroviral sequence.

17. (Amended) The kit for the detection and/or evaluation of an autoimmune disease and in particular of neuropathological conditions with an autoimmune etiology, characterized in that it comprises, in addition to the buffers necessary for carrying out a method according to [any one of claims 14 to 16] claim 14:

- diagnostic reagents A selected from the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2, characterized in that it is selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate label [as claimed in any one of claims 5 to 9], and

- reagents B consisting of the transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/deregulation of motifs belonging to said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of said HERV-7q family, of which one of the ends cannot be at a distance exceeding 120 kb,

- which reagents are preferably attached to an appropriate support.

19. (Amended) Translational products, characterized in that they are encoded by a nucleotide sequence as claimed in [any one of claims 1 to 4] claim 1.

20. (Amended) A peptide, characterized in that it is capable of being expressed with the aid of a nucleotide sequence selected from the group consisting of the sequences SEQ ID NO: 1-22, 28 and 61 as claimed in [any one of claims 1 to 4] claim 1.

22. (Amended) The peptide as claimed in claim 20 [or claim 21], characterized in that it is selected from the group consisting of:

- the sequences SEQ ID NO: 23-36;
- the sequence SEQ ID NO: 58;
- a C-terminal fragment of the sequence SEQ ID NO: 26, either from the amino acid 291, or from the amino acid 321, starting from the first methionine of the sequence SEQ ID NO: 26;
- a peptide of the CKS-17/CKS-25 type present in one of the sequences SEQ ID NO: 23-36 or 58; and
- the peptides having affinity with one of the haplotypes of the class I or class II HLA system and in particular the fragments 399-471, 244-271 of enverin, as well as the peptides having the sequence SEQ ID NO: 68-118, in accordance with Table I.

23. (Amended) The peptide as claimed in [any one of claims 20 to 22] claim 20, characterized in that it is obtained from nucleic sequences as claimed in any one of claims 1 to 4, in which at least one non-sense codon may be replaced with a codon encoding one of the following amino acids: Phe (F), Leu (L), Ser (S), Tyr (Y), Cys (C), Trp (W), Gln (Q), Arg (R), Lys (K), Glu (E) or Gly (G).

26. (Amended) The composition as claimed in claim 24 [or claim 25], characterized in that said peptide has the sequence SEQ ID NO: 120.

27. (Amended) An antibody, characterized in that it is directed against one or more of the peptides as claimed in [any one of claims 20 to 23] claim 20.

30. (Amended) A method for the identification and detection of endogenous retroviral motifs which are abnormally expressed in the context of pathological conditions associated with cancer, or of neuropathological conditions, in particular autoimmune neuropathological conditions, at the forefront of which is multiple sclerosis, characterized in that it comprises the comparative analysis of the sequences extracted from a biological sample and the sequences as claimed in [any one of claims 19 to 23] claim 19.

31. (Amended) An application of the sequences as claimed in [any one of claims 1 to 9, 13, 14 or 19 to 23] claim 1 to the diagnosis of, to the prognosis of, to the evaluation of genetic susceptibility to, any induced, congenital or acquired human diseases, in particular those with cancerous, autoimmune and/or neurological components, such as multiple sclerosis, the associated syndromes and the neurodegenerative diseases in which all or part of the sequences [as claimed in to any one of claims 1 to 5] in claim 1 and related endogenous or exogenous forms are involved.

32. (Amended) Hybrid nucleic sequences, characterized in that they comprise sequences or motifs as claimed in [any one of claims 1 to 9] claim 1, combined with sequences or motifs of endogenous origin or of exogenous origin or induced exogenously.

33. (Amended) A recombinant cloning or expression vector, characterized in that it comprises a nucleic sequence as claimed in [any one of claims 1 to 4] claim 1.

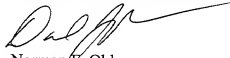
35. (Amended) A gene therapy vector, characterized in that it comprises all or part of the endogenous retroviral nucleic sequences of the HERV- 7q type as claimed in [any one of claims 1 to 4] claim 1.--

REMARKS

Claims 1-37 are active in the present application. The claims are amended to remove multiple dependencies. No new matter is added. An action on the merits and allowance of the claims is solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Daniel J. Pereira, Ph.D.
Registration No. 45,518



22850

(703) 413-3000
Fax #: (703)413-2220
DJP/la
I:\user\DJPER\200936-pr.wpd

WO 99/67395

PCT/FR99/01513

NUCLEIC SEQUENCE AND DEDUCED PROTEIN SEQUENCE FAMILY
WITH HUMAN ENDOGENOUS RETROVIRAL MOTIFS, AND THEIR USES

The present invention relates to a novel
5 nucleic sequence and deduced protein sequence family
with complete or partial human endogenous retroviral
motifs, and sequences flanking or adjacent to said
sequences, and controlled by the latter; modification
of the expression or impairment of the structure
10 (polyadenylation, alternative splicing and the like) of
said flanking sequences.

The invention also relates to the detection
and/or use of said nucleic sequences and of said
corresponding protein sequences in the context of
15 diagnostic, prophylactic and therapeutic applications,
in particular for neuropathological conditions with an
autoimmune component such as multiple sclerosis.

The invention also relates to the production of
antisense double-stranded and single-stranded nucleic
20 probes, of ribozymes, capable of modulating viral
replication (T.R. Cech, *Science*, 1987, 236, 1532-1539;
R.H. Symons, *Trends Biochem. Sci.*, 1989, 14, 445-450)
of the corresponding recombinant molecules, and
associated antibodies.

25 Retroviruses are viruses which replicate solely
by using the opposite route to the conventional
processing of genetic information. This process, called
reverse transcription, is mediated by an RNA dependent
DNA polymerase or reverse transcriptase, encoded by the
30 pol gene. Retroviruses also encode at least two
additional genes. The gag gene encodes the proteins of
the skeleton, matrix, nucleocapsid and capsid. The env
gene encodes the envelope glycoproteins. Retroviral
transcription is regulated by promoter regions or
35 "enhancers" situated in highly repeated regions or LTR
(Long Terminal Repeat) and which are present at both
ends of the retroviral genome.

During the infection of a cell, polymerase
makes a DNA copy of the RNA genome; this copy may then

integrate into the human genome. Retroviruses do not kill the cells which they infect, but on the contrary often enhance their rate of growth. Retroviruses can infect germ cells or embryos at an early stage; they can, under these conditions, integrate the germ line and be transmitted by vertical Mendelian transmission, which constitutes the closest relationship between a host and its parasite. These endogenous viruses can degenerate during generations of the host organism and lose their initial properties. However, some of them may conserve all or part of their properties or of the properties of their constituent motifs, or acquire novel functional properties having an advantage for the host organism, which would explain the preservation of their sequence.

The existence of endogenous motifs having long open reading frames and/or subjected to a strong selection pressure can therefore be an indication of a preserved or acquired biological function, which may correspond to a benefit for the host organism. These retroviral sequences can also undergo, over the generations, discrete modifications which will be able to trigger some of their potentials and generate or promote pathological processes. It has recently appeared necessary to carry out a review and to identify these sequences so as to be able to evaluate their functional impact.

Human endogenous retroviral sequences or HERVs represent a substantial part of the human genome. These retroviral regions exist in several forms:

- complete endogenous retroviral structures combining *gag*, *pol* and *env* motifs, flanked by repeat nucleic sequences which exhibit a significant analogy with the LTR-*gag-pol-env*-LTR structure of infectious retroviruses,
- truncated retroviral sequences; for example the retrotransposons lack their *env* domain and the retroposons do not possess the *env* and LTR regions.

Up until now, the study of these regions of the genome has been neglected in humans for essentially two reasons:

- the existence of insertions/deletions which can shift the reading frame and of mutations which modify the sequence. These modifications cause impairment of the structure and consequently of the biological function of these motifs,
- the absence of confirmed associations with human pathological conditions.

The recent knowledge of fragments which are significantly representative of the human genome and an orientation of research studies toward a study of structure/function of endogenous retroviral motifs have made it possible to specify the importance of these regions. The involvement of truncated or complete endogenous sequences in pathological conditions in animals is documented; for example their association with tumor processes has been clearly demonstrated (S.K. Chattopadhyay et al., 1982, *Nature*, **295**, 25-31). Research aimed at specifying the association or the influence of HERVs in human pathological conditions is now therefore justified.

A classification of the HERV elements has been proposed (Tönjes R.R. et al., *AIDS & Hum. Retroviral.*, 1996, **13**, p261-p267; A.M. Krieg et al., *FASEB J.*, 1992, **6**, 2537-2544). It is based on a homology of these sequences with retroviruses isolated in animals, with the aid of heterologous retroviral probes. Indeed, in general, the HERVs exhibit relatively little homology with known human infectious retroviruses.

The class I families exhibit a sequence homology with the type C mammalian retroviruses; there may be mentioned in particular the ERI superfamily, close to the MuLV virus (*murine leukemia virus*) and to the BaEV virus (*baboon endogenous virus*).

The class II families exhibit a sequence homology with the type B mammalian retroviruses such as

MMTV (mouse mammary tumor virus) or the type D retroviruses such as SRV (squirrel monkey retrovirus).

Other families have also been described; among these, there may be mentioned HERVs which exceptionally exhibit partial homology with HTLV-1 (RTVL-H) or primate viruses; HRES-1, for example, exhibits sequence homology with HTLVs.

Programmes for very large sequencing of the human genome now make it possible to have available a significant number of novel retroviral sequences. The use of data processing software packages makes it possible to identify and analyse these genes. In this context, a systematic search relating to the entire information available to date has been initiated in order to identify novel human endogenous retroviral sequences as a function of certain analytical criteria:

- presence of long open reading frames conserved during evolution of the host organism and which may suggest a biological function,
- analogy with sequences already characterized outside or inside the retrovirus domain,
- location in regions of susceptibility for certain pathological conditions or close to essential genes, for example in the cancer domain, regulation of the immune system or in certain neuropathological conditions.

The work carried out by the inventors on sequence databases allowed them to identify a set of endogenous retroviral sequences or motifs whose normal or pathological expression can promote or disrupt a protective effect in relation to pathological processes, or play a role in the onset or worsening of pathological conditions.

The subject of the present invention is a purified nucleic acid fragment, characterized in that it comprises all or part of a sequence encoding a human endogenous retroviral sequence, which has at least env-type retroviral motifs, corresponding to the sequence SEQ ID NO: 1 or to a sequence exhibiting a level of

homology with said sequence SEQ ID NO: 1 greater than or equal to 80% on more than 190 nucleotides or greater than or equal to 70% on more than 600 nucleotides for the env-type domains.

5 The expression homologous sequence is understood to mean both a sequence which exhibits complete or partial identity with the abovementioned sequence SEQ ID NO: 1 and a sequence which exhibits partial similarity with said sequence SEQ ID NO: 1.

10 According to an advantageous embodiment of said fragment, it has retroviral motifs corresponding to an env domain and corresponding to the sequence SEQ ID NO: 1 and retroviral motifs corresponding to a gag domain and corresponding to the sequence
15 SEQ ID NO: 2 or to a sequence exhibiting a level of homology greater than or equal to 80% on more than 190 nucleotides or greater than or equal to 70% on more than 600 nucleotides for the env-type domains and a level of homology greater than or equal to 90% on more
20 than 700 nucleotides or greater than or equal to 70% on more than 1 200 nucleotides for the gag-type domains, said motifs having no insertion or deletion of more than 200 nucleotides.

 Said fragments constitute a novel family of
25 human endogenous retroviral sequences (HERV-7q family) which exhibits sequence homology with the MSRV retroviruses, as described in International Application WO 97/06260; said fragments according to the present invention have:

30 - two repeat nucleotide motifs of 711 bp (Figure 3), having characteristic signals identified in LTRs (*Long Terminal Repeats*): transcription promoters of the TATAA or CCAAT box type. These repeat domains delimit three deduced motifs of the gag, pol and env
35 type (Figure 2),

 - an env-type motif (positions 6965 nt - 9550 nt on the sequence SEQ ID NO: 3 or in Figure 1) which contains a long open reading frame of 1 620 nucleotides (positions 7874-9493 of the sequence

- ID NO: 3 and Figure 1) encoding a protein having an unpublished sequence of 540 amino acids called envrin (Figure 4 and SEQ ID NO: 26) and underlined fragment in Figure 18. There is present inside the transmembrane domain of this env domain a peptide motif of the CKS-25/CKS-17 type (Figure 5), recognized as having immunosuppressive functions on the host lymphocytic cells (M. Mitani et al., 1987, *Proc. Natl. Acad. Sci. USA*, **84**, 237-240). A zinc finger type domain
- 10 HX₃₋₄HX₂₂₋₃₃CX₂C (Kulkolski et al., 1992, *Mol. Cell. Biol.*, **12**, 2331-2338), which is present in integrase-type domains is identified in another reading frame. This particular env domain signatures the characteristic of novel endogenous retroviral motifs,
- 15 the motif (positions 3065 nt - 4390 nt on the sequence SEQ ID NO: 3) of the gag type encoding protein motifs according to Figure 6 (SEQ ID NO: 58) (positions 3118-4198 of SEQ ID NO: 3) was identified by virtue of analogies with known gag domains. The region of major
- 20 homology QX₃EX₃R is for example present (Benit et al., 1997, *J. Virol.*, **71**, 5652-5657). The nucleic acid binding motif CX₂CX₃₋₄HX₄C, situated at the C-terminal position, is identified in another reading frame (Covey et al., 1986, *Nucleic Acids Res.*, **14**, 623-633).
- 25 Upstream of the gag domain, a motif of 182 nucleotides is detected which is repeated twice (Figure 1),
- the pol domain exhibits the conventional consensus of a retrovirus pol region at the level of the protease, reverse transcriptase and RNase H
- 30 domains. A motif close to the consensus LLDTGA is found in pol (Weber et al., 1988, *Science*, **243**, 928-931). The motifs D and AF, LPQ and SP, and YVDD (Xiong and Bickbush, 1990, *EMBO J.*, **9**, 3353-3362) are respectively found in the 3rd, 4th and 5th homology boxes. The
- 35 motifs YTDGSS and TDS are present in the RNase H region,
- the gag and pol regions could be considered as being joined with a passage from the gag region to the pol region by a reading frame shift.

The present invention includes the sequences belonging to the HERV-7q family as defined above (presence of the SEQ ID NO: 1 sequence or of a homologous sequence or presence of both the sequences
5 SEQ ID NO: 1 and SEQ ID NO: 2) and in particular the sequences SEQ ID NO: 3-22, 28 and 61; it also includes the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences as well as fragments derived from the coding regions of
10 the preceding sequences corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences (SEQ ID NO: 37-57, 59-60 and 121-122).

These various fragments may be advantageously
15 used as primers or as probes (reagents A); they hybridize specifically under high stringency conditions to a sequence of the HERV-7q family.

Among these fragments, the following fragments may be preferably mentioned:

20 - a fragment of 182 nucleotides, repeated twice, situated upstream of the gag domain at positions 2502-2611/2613-2865 of SEQ ID NO: 3:

Primers and probes specific for the gag region

- a sense primer G1F located in the region
25 upstream of the gag domain of HERV-7q:
5'GGACCATAGAGGACACTCCAGGACTA3' (SEQ ID NO: 37);

- an antisense primer G1R located in the terminal 3' region of the gag domain:
5'CCTCAGTCCCTGCTGCTGGATCATCT3' (SEQ ID NO: 38)

30 - the fragment of 1505 nt amplified by the pair G1F-G1R is used in order to generate the probes capable of hybridizing the various PCR amplification products:

- a nested sense primer G2F: (SEQ ID NO: 39)

5'CCTCCAAGCAGTGGGAGGAAGAGAATT3'

35 - a nested antisense primer G2R: (SEQ ID NO: 40)

5'CCTTCCTGTGTTATTGTGGACATCATT3'

- a nested sense primer G4F: (SEQ ID NO: 41)

5'GGAAGAAGTCTATGAATTATTCAATGATGT3'

- a nested sense primer G3F: (SEQ ID NO: 42)

5'GGGACACAGAATCAGAAATGGAGATT3'
- a nested antisense primer G4R: (SEQ ID NO: 43)
5'GCCTTCAGAAGAGTCAGGTGACAGAGA3'
- a nested antisense primer G5R: (SEQ ID NO: 44)
5'GAGCCTCCAAAGTCCACTTGCCTGA3'
Primers and probes specific for the env region
- a sens primer E1F: (SEQ ID NO: 45)
5'GATTTTCAGTATCTACTAGTCTGGGTAGAT3'
- an antisense primer E1R: (SEQ ID NO: 46)
5'CTAGGAAATCCAGCTAGTCTGTCTCA3'
- the fragment of 2529 nt, amplified by the pair
of primers E1F-E1R, is used to generate the probes
capable of hybridizing the various PCR amplification
products:
- a sense primer E2F: (SEQ ID NO: 47)
5'CCAAGACAGCCAAGTCTAGTTGCAGACAT3'
- an antisense primer E2R: (SEQ ID NO: 48)
5'GGACGCTGCATTCTCCATAGAACTCTT3'
- a sense primer E3F: (SEQ ID NO: 49)
5'GCAATACTACATACACAACCAACTCCCAA3'
- an antisense primer E3R: (SEQ ID NO: 50)
5'GGGGGAGGCATATCCAACAGTTAGTA3'
- a sense primer E4F: (SEQ ID NO: 51)
5'CCATCTACACTGAACAAGATTTATACACTT3'
- an antisense primer E4R: (SEQ ID NO: 52)
5'AATGCCAGTACCTAGTGACACCTAGCACT3'
- a sense primer E5F: (SEQ ID NO: 53)
5'CGAATACAACGTAGAGCAGAGGAGCTTCGAA3'
- a sense primer E6F: (SEQ ID NO: 54)
5'AGCCCAAGATGCAGTCCAAGACTAAGAT3'
- a primer E5R: (SEQ ID NO: 55)
5'GCGTAGTAGAGTTGTGCAGCTGAGAT3'
- a primer ExF: (SEQ ID NO: 56)
CCCTTACCAAGAGTTTCTATGGAGAAT
- a primer ExR: (SEQ ID NO: 57)
ACCGCTCTAACTGCTTCCTGCTGAATT

All the oligonucleotides are designed to be able
to generate a sense primer and an antisense primer by a
shift in the sequence of the reference primer of 1 to 7

nucleotides toward the 5' side or toward the 3' side; the modification of the sequence may cause a modification of the size of the primer of 1 to 7 nucleotides depending on the cases. The primers chosen
5 may be optimized depending on the cases by shortening or extension affecting 1 to 9 nucleotides.

Preferably, the hybridization, cloning, subcloning, production, preparation and analysis of the nucleic acids, peptides and antibodies, the sequencing
10 of the nucleic acids and peptides, the *in situ* hybridization and the immunohistochemistry are carried out under the conditions described in the following books:

- Current Protocols in Molecular Biology, Eds.
15 F.M. Ausubel, R. Brent & R.E. Kingston et al. Green Publishing associates and Wiley Interscience.

- Molecular Cloning: a laboratory manual. Eds.
J. Sambrook, E.F. Fritsch & T. Maniatis, Cold Spring Harbor Laboratory Press, Cold Spring Harbor.

- The Practical Approach series. Eds.
20 D. Rickwood & B.D. Ames, IRL Press and Oxford University Press. In particular antibodies I & II; DNA cloning I, II, III; Nucleic acid and protein sequence analysis; Nucleic acid hybridization; Nucleic acid
25 sequencing; Oligonucleotide synthesis; Protein purification applications; Protein purification methods; Protein sequencing; Transcription and translation; Gels electrophoresis of nucleic acids; Gels electrophoresis of proteins; Genome analysis; HPLC
30 of macromolecules; Human genetic diseases; Microcomputing in biology; Molecular neurobiology; Mutagenicity testing; Essential molecular biology I & II.

- Proteome research: New frontiers in
35 functional genomics, Eds. M.R. Wilkins et al., Springer.

The human endogenous retroviral sequence (SEQ ID NO: 3) situated on the long arm of chromosome 7 corresponds to the HERV-7q sequence; it has 10.5 kb

03719534-01-1001

(Figs. 1 and 2) and satisfies the criteria defined above.

The search for domains exhibiting total or partial similarity with the *gag* and *env* regions of
5 HERV-7q resulted in the identification of novel endogenous retroviral sequences. These sequences may have the structure of a complete endogenous retrovirus such as the endogenous retroviral sequence situated close to the gene for the alpha and delta subunits of
10 the T cell receptor, and consequently called HERV-TcR; by way of example, Figure 7 shows the comparison of the nucleic alignments of the respective *gag* domains of HERV-7q and HERV-TcR (sequence HG12, SEQ ID NO: 19). Partial retroviral structures also exist. These
15 retroviral domains, similar to HERV-7q, are identified in independent nucleic sequences as shown by their chromosomal location. Nucleic motifs (called here HEX or HGx, and analogous to *env* or *gag* type domains, respectively) resembling the *env* or *gag* domains of
20 HERV-7q were found, with the aid of the abovementioned databases:

- HE2: chromosome 17 (SEQ ID NO: 4),
- HE3 and HG3: chromosome 6 (SEQ ID NO: 5 and 6),
- HE4: chromosome X (SEQ ID NO: 7),
- 25 - HE5: chromosome X q22 (SEQ ID NO: 8),
- HE6 and HG6: chromosome 1 q23.3-q24.3 (SEQ ID NO: 9 and 10),
- HE7: chromosome 7 p15 (SEQ ID NO: 11),
- HE8 and HG8: chromosome 19 (SEQ ID NO: 12 and
30 13),
- HE9: chromosome X (SEQ ID NO: 14),
- HE10: chromosome X q13.1-21.1 (SEQ ID NO: 15),
- HE11 and HG11: chromosome 7 q21-22 (SEQ ID NO: 16 and 17),
- 35 - HE12 and HG12, in HERV-TcR: chromosome 14 q11.2 (SEQ ID NO: 18 and 19),
- HE13 (SEQ ID NO: 61): chromosome 6 q24.1-24.3

The present invention also includes the coding and noncoding fragments for all or part of *env*erin

comprising at least 14 nucleotides and in particular the fragments encoding the C-terminal part of enverin, either from amino acid 291, or from amino acid 321, starting from the first methionine.

5 These fragments comprise in particular a critical zone where two inserts of 12 nucleotides were characterized:

 - a first insert was identified (sequence A) in individuals of 2 groups (patients and controls). This
10 insert, situated between amino acids 487 and 488, makes it possible to insert the tetrapeptide VLQM. A comparative analysis shows that this insert is identified in a homologous region situated in the sequence HE13, belonging to the HERV-7q family. The
15 amplification of the HE13 type sequence could indicate that there is an impairment of the enverin sequence of HERV-7q, which would promote the amplification of the sequence contained in HE13. This observation also makes it possible to use this insert as a specific element
20 for amplification of sequences of the HE13 type.

 A second insert (sequence B) was identified in a patient with MS. The insert of 12 nucleotides is situated at the level of amino acid 495 and encodes the tetrapeptide MQSM. It is remarkable to observe that
25 this insert is also identified in a homologous region situated in HE13.

 Sequence A: TAAACTACAAATGGTTCTTCAAATGGAGCCCA
(SEQ ID NO: 59)

 Sequence B: GATGCAGTCCAAGATGCAGTCCATGACTAAGA
30 (SEQ ID NO: 60).

 These observations demonstrate modifications of the enverin sequence of the HERV-7q type which constitute the basis for a detection strategy by allele-specific amplification (AS-PCR), making it
35 possible to detect these differences in a population and which could correspond either to a mutation/deletion associated with a degree of susceptibility, or to a polymorphism, or to a

mutation/deletion associated with a pathological condition such as multiple sclerosis.

The alignments of the *env* (Fig. 8) and *gag* (Fig. 9) domains explain the levels of homology observed between the sequences described above and the homologous sequences in HERV-7q. The analogies can extend to the flanking retroviral motifs.

Analysis of the sequence tags available in databases shows that transcripts belonging to some members of this family, in particular HERV-7q, are essentially expressed in tissues of foetal or placental origin.

Polypeptide sequences generated by these transcripts can therefore be potentially produced and biological functions or activities can be envisaged, by analogy with biologically active polypeptides of viral or retroviral origin; for example, the peptide motifs of the CKS-17 type (Haraguchi et al., PNAS, 1995, 92, 5568-5571) (Fig. 5) or CKS-25 type (Huang S.S. and Huang J.S., J. Biol. Chem. 1998, 273, 4815-4818) which have immuno-modulatory functions on the lymphocytic host cells. The differences in sequence which are observed and possible normal or pathological modifications are in particular responsible for modulation of the function.

HERV-7q represents the paradigm of the novel family of human endogenous retroviral sequences or of endogenous retroviral motifs.

HERV-7q and some of the endogenous retroviral sequences belonging to its family have a *pol*-type domain analogous to *pol*-type retroviral sequences such as for example the *pol* region identified in the MSRV retrovirus associated with multiple sclerosis and described by H. Perron et al. (1997, Proc. Natl. Acad. Sci. USA, 94, 7583-7588; International Application PCT WO 97/06260).

However, the sequences according to the present invention are distinguishable from the infectious exogenous retroviral sequences analogous to MSRV

previously described in that the *gag* and *env* sequences according to the invention are significantly different according to the criteria defined above and as a function of certain specific characteristics, for example the long open reading frame of the *env* domain of HERV-7q; they would be able to allow the signaturing of a pathological condition when they have insertions, deletions, reading frame shifts or mutations.

Indeed, the differences observed between the human sequences of the HERV-7q type, which are isolated from individuals reputed to be normal, and the sequences derived from some samples of pathological origin are not randomly distributed. Comparisons carried out between the *gag* region obtained from infectious retroviral particles (EMBL accession No.: A60168, A60200, A60201, A60171 and the like) and the corresponding *gag* sequence of HERV-7q (Fig. 9), make it possible to observe that the mutations preferably affect non-sense codons. For example, two non-sense codons in HERV-7q are replaced by an arginine codon in A60200, which makes it possible to obtain a deduced sequence of 109 amino acids for HERV-7q and of 166 amino acids for A60200. The base changes consequently make it possible to extend the reading frame and to potentially encode larger sized polypeptide structures (Figure 10).

Likewise, an *env*-type sequence obtained from infectious retroviral particles exhibits a significant analogy with the *env* domain of HERV-7q (Figure 11). These marked analogies between exogenous and endogenous retroviral sequences could be responsible for the triggering or worsening of certain pathological processes, in particular certain autoimmune diseases such as multiple sclerosis. In this regard, it is possible to note that certain endogenous retroviral sequences described in the invention are situated close to or in regions reputed to exhibit susceptibility for multiple sclerosis: for example HERV-7q and the 7q21-22 region of chromosome 7, likewise for HEI2 and HG12 in

HERV-TcR and the region of the gene encoding the alpha and delta chains of the T cell receptor, HE2 and chromosome 17, or HE3, HE13 and HG3 and chromosome 6, for example, the sequences HE11 and HG11, around the
5 region 7q 21-22 or HE4, HE5, HE6, HE9, HE10 or HG10 on the X chromosome. These sequences would therefore be capable of providing the means for locating or identifying the genes for predisposition.

No significant homology is observed with
10 endogenous retroviral sequences already described; on the other hand, a limited homology may be noted, which makes it possible to identify a general structure of the env domain; however, said homology is less than the criteria defined according to the invention between the
15 env domains of the sequence HERV-7q (SEQ ID NO: 1) and the sequence HERV-9 (Figure 12). Figure 11 shows extensive homologies between the sequence HERV-7q with an exogenous retroviral sequence (accession No. EMBL: A60170).

20 The human endogenous retroviral sequences belonging to the HERV-7q family can protect against attacks linked to the environment or can be beneficial for the individual. This beneficial effect could be one of the possible reasons for the selection pressure
25 exerted on some of these sequences and the potentially functional character of the deduced protein structures identified: for example the long open reading frame capable of encoding a novel protein and corresponding to the env domain of HERV-7q.

30 The human endogenous retroviral sequences belonging to the HERV-7q family could be associated, for example, with pathological conditions related to processes linked to cancer, to neuropathological conditions with an autoimmune component or to any other
35 pathological process in association or otherwise with endogenous or exogenous viruses or retroviruses. Their action could be related to the outbreak, the worsening, the modification of the time of appearance or the protection against the disease.

In the context of application to autoimmune pathological conditions (such as for example lupus, Sjögren's syndrome, rheumatoid arthritis, multiple sclerosis and the like), significant analogies may be
5 detected between the endogenous retroviral motifs identified and motifs found in retroviral structures characterized in patients with autoimmune pathological conditions such as multiple sclerosis; for example, fragments of *gag* domain (recently available in
10 databases) obtained from infectious retroviral particles or the complete sequence of the *pol* domain corresponding to the MSRV virus associated with multiple sclerosis. These retroviral motifs possess significant analogies with homologous endogenous
15 sequences of the HERV-7q type, which makes it possible to envisage direct or indirect association with pathological processes, including multiple sclerosis, in association or otherwise with MSRV.

The importance of these sequences goes beyond
20 the context of autoimmune diseases. Apart from the general importance of retroviral motifs in the triggering or worsening of a tumor process, which is well established in particular in murine models (H. Fan in *The retroviridae*, 1994, ed. J.A. Levy, Plenum, New
25 York, p. 313-353), these sequences could be present close to or inside important genes and could alter the expression thereof: for example HERV-TcR and the genes for the alpha and delta subunits of the receptor for the T cells involved in disruptions of the immune
30 system.

The present invention includes, in addition, the use of sequences combined with the sequences of the HERV-7q family for the detection and/or prognosis of various autoimmune diseases (neuropathological
35 conditions in particular); these sequences encode all or part of a factor whose function, the regulation/de-regulation or alteration (polyadenylation, alternative splicing), is associated with the normal or pathological expression or with the regulation/de-

regulation of the motifs belonging to the HERV-7q family and correspond to transcripts or cDNAs of the nucleotide sequences encoding genes situated in regions flanking or delimiting retroviral sequences of the
5 HERV-7q family.

The expression flanking region is understood to mean any region situated close to (contained in or including) an endogenous retroviral sequence belonging to the HERV-7q family, as defined above, up to and
10 including the genes immediately contiguous and/or situated at a distance which cannot exceed 120 kb.

The inventors have now found that the presence of the retroviral sequences as defined above disrupts the expression or impairs the structure of the flanking
15 sequences defined below.

The transcripts of said flanking sequences (and fragments thereof, in particular those underlined or in italics in Figures 14-16, 22-26, as defined below:

- at 1021 bp upstream of HERV-7q, there is
20 identified an endogenous retroviral sequence called RH7 (SEQ ID NO: 62 and Figure 22); this sequence is situated in 5' of the HERV-7q sequence; in Figure 22, the portion in italics corresponds to the beginning of the HERV-7q sequence; the RH7 sequence is underlined;
25 two putative polyadenylation sites are in bold. This sequence SEQ ID NO: 62 exhibits significant homology, on more than 6 kb, with RGH-type endogenous retroviral sequences (Figure 13). Sequences belonging to this family are expressed in particular in patients with
30 rheumatoid osteoarthritis (Nakagawa et al., (1997), Arthritis, Rheum., 40, 627-638). The present invention also includes fragments of the sequence SEQ ID NO: 62, comprising between 14 and 50 nucleotides (used as primers), preferably between 14 and 25 nucleotides, or
35 at least 25 nucleotides (used as probe), which fragments have the following characteristics: the 4 nucleotides of the 3' end are different from the corresponding motifs of the sequence RGH2 (bottom sequence in Figure 13, GenBank accession No.: D110 18),

09719554.011304

- at less than 9 kb upstream of HERV-7q, there is identified the sequence RAM75 (SEQ ID NO: 63 and Figure 14) containing the 24 coding exons (which cover close to 41 kb) of the gene for peroxisomal ATPase PEX1. PEX1, in combination with PEX6, is responsible for the import of peroxisomal proteins and for stabilizing the PEX5 receptor. A disruption/alteration affecting PEX1 is responsible for various neuropathological conditions such as Zellweger syndrome, neonatal adrenoleukodystrophy and the infantile form of Refsum's disease (Reuber et al., (1997), Nature Genet., 17, 445-448). It can be recalled that the main function of the peroxisomes is associated with the metabolism of fatty acids, in particular by β -oxidation processes. Impairment of the gene identified in the sequence RAM75, or of its expression, by modification of the function of the regulatory 5' and 3' regions or by modification of the splittings or of the polyadenylation processes, in particular under the influence of neighboring retroviral motifs, would be able to disrupt the expression and the structure of ATPase and consequently to disrupt one of the peroxisomal functions, in particular the metabolism of lipids, in particular myelin lipids, with consequences for certain pathological conditions, including neuropathological conditions such as multiple sclerosis; the underlined portions (Figure 14) correspond to the 24 coding exons.

The present invention also includes the fragments of the sequence SEQ ID NO: 63, included in the abovementioned 24 coding exons and comprising at least 14 nucleotides.

Analysis of the expression profile (transcripts and proteins) of the sequence RAM75 (SEQ ID NO: 63) is a good indicator for the differential diagnosis of neuropathological conditions with an autoimmune component.

In Figure 14, the coding exons are underlined. The initiation and non-sense codons as well as the

putative polyadenylation sites are in bold and underlined;

- at 0.7 kb downstream of the sequence HERV-7q and on nearly 17 kb (SEQ ID NO: 64 and Figure 15), there is identified the nucleotide sequence RAV73, where there are detected sequence tags and potential exons capable of producing one or more polypeptide sequences; the invention also includes fragments of this sequence SEQ ID NO: 64 included in the sequence tags and the potential exons as they appear (portions underlined) in Figure 15, which fragments comprise at least 14 nucleotides,

- at 120 kb upstream of the sequence HG3, and on 15 kb, there is the nucleotide sequence RBP3 (SEQ ID NO: 65 and Figure 23), which covers the 3' end of the gene encoding a transcription factor of the Blimp-1 family (SEQ ID NO: 119 and Figure 25), a protein of 789 amino acids which is a repressor of the expression of the interferon-beta gene (Keller and Maniatis, Genes Dev., (1991), 5, 868-879), which is already associated with certain malignant pathological conditions (Mock et al., Genomics, (1996), 37, 24-28), and which could play a role in the differentiation and the pathogenesis of B cells. The possible association of the endogenous retroviral sequence containing the motifs HG3 and HE3 and of Blimp-1 has many benefits, in the case of pathological conditions, and in particular multiple sclerosis. Blimp-1 acts in particular on the B cells whose contribution in inflammatory processes associated with multiple sclerosis is known. Blimp-1 is capable of blocking the viral induction of the INFB promoter whose capacity to reduce the frequency of attacks and the progression of lesions in patients with MS is known. Disruption in the expression or the structure of Blimp-1, in relation to a retroviral element of the HERV-7q type, is consequently associated with neuropathological conditions or with diseases having an autoimmune character, such as multiple sclerosis; this nucleotide sequence RBP3 (SEQ ID

NO: 65) contains nucleotide motifs identified in the nucleic sequence encoding the Blimp-1 gene; the invention also includes the detection of the mRNA sequences for the Blimp-1 protein (SEQ ID NO: 119),

- 5 - the endogenous retroviral sequence of the
HERV-7q type, containing HE3 and HG3, is situated in
the HI3 region corresponding to an intron extending
over more than 46 kb (SEQ ID NO: 66), of a gene which
could encode the analogue of APS (Figure 24), a protein
10 of 275 amino acids specific to apoptosis, overexpressed
in various cells in culture after triggering an
apoptotic process (Hammond et al., FEBS Lett., (1998),
425, 391-395). The intron is situated at the level of
amino acid 231 of APS. The end of HE3 is at more than
15 12 kb from the 5' end of the intron, whereas HG3 is
situated at more than 28 kb from the 3' end of the
intron. Apoptotic processes are associated with
multiple sclerosis. In particular, there has been
described an apoptotic process affecting astrocytes and
20 oligodendrocytes in the presence of a purified fraction
of cerebrospinal fluid of patients suffering from
multiple sclerosis (Ménard et al., J. Neurol. Sci.,
(1998), 154, 209-221).

- Finally, it should be stressed that the nucleic
25 region containing HE3, HG3, HI3 and RBP3 is located at
the level of the short arm of chromosome 6, in 6p21,
which is a proposed region of susceptibility to
multiple sclerosis (The Multiple Sclerosis Genetic
Group, Nature Genet., (1996), 13, 469-472).

- 30 The interaction between the HERV-7q type
sequences and the flanking sequences and the importance
of establishing a profile of expression including one
or more of the abovementioned sequences in order to
establish a differential diagnosis of a neuro-
35 pathological condition is even more evident because it
is observed that the sequences HG12 and HE12 are
situated in an intron region of the gene encoding the
alpha and delta subunits of the T cell receptors. The T
cell receptors are involved in the immune regulation

process and their influence has been proposed in the case of autoimmune diseases, including multiple sclerosis.

The subject of the invention is also
5 transcripts generated from the abovementioned sequences as well as those optionally exhibiting modifications in the reference sequences described in the invention when they are expressed in certain patients.

Indeed, the systems for regulating the the
10 expression of the retroviral proteins of HERV-7q, which are present in the LTR type motifs, could influence the expression of genes situated in the close or distant chromosomal vicinity and could induce disruptions of an immunological and/or neurological character. For
15 example, the endogenous retroviral sequence HERV-TcR exists in the immediate vicinity of the genes for the alpha and delta subunits of the T cell receptor previously described. The LTR-type motifs could also encode superantigens (Acha-Orbea and Palmer, 1991,
20 *Immunol. Today*, 12, 356-361). In general, retroviral proteins of the HERV-7q or related type, or their truncated or partial forms could be involved in cytotoxicity or superantigenicity phenomena, such as for example those derived from the long open reading
25 frame identified in the env domain (Figure 4).

Sequences of the HERV-7q 5' and 3' LTR type, which are highly conserved, are involved in such regulatory effects. By way of example, LTX is described, which is a sequence comparable to that of an
30 HERV-7q LTR (SEQ ID NO: 67 and Figure 16), and which is present in the center of an intron of more than 49 kb, but at 2 kb from the donor 5' site of the FMR2 gene associated with fragile X and encoding a protein of 1311 amino acids (Figure 26). The LTRs modulate the
35 alternative splicing (Kapitonov and Jurka, (1999), *J. Mol. Evol.*, 48, 248-251), the expression of the gene, the binding to nuclear proteins (Akopov et al., (1998), *FEBS Lett.*, 421, 229-233), or allow the

production of an alternative polyadenylation signal (Goodchild et al., (1992), Gene, 121, 287-294).

In general, there may be noted the existence of several endogenous retroviral sequences of the HERV-7q type (HE4, HE5, HE9, HE10), situated at the level of chromosome X which represents the chromosome associated with the largest number of pathological conditions.

In this regard, it is possible to note that retroviral motifs derived from defective regions are capable of having biological functions; for example, the envelope protein p15E, derived from defective retroviral motifs, possesses an anti-inflammatory and immunosuppressive activity (Snyderman and Ciancolo, 1984, *Immunol. Today*, 5, 240-244).

These structures are probably capable of causing breaks or of amplifying deregulations in the immune defense processes. Some of the motifs of the gag, env and LTR-type domains may be associated with a particular function or may contribute to the normal or pathological function of the flanking domains as defined above (SEQ ID NO: 62-67). Recombinations with an element of exogenous, retroviral origin or otherwise can give rise to the production of nucleic or protein motifs which could either protect or trigger or promote or worsen a pathological condition. Likewise, a retroviral structure containing endogenous retroviral elements according to the invention would be capable of causing a pathological process after passing through an exogenous transient cycle followed by reintegration into a sensitive or critical region of the human genome.

It is thus possible to obtain expression profiles (transcripts and optionally proteins) which correspond to the abovementioned neuropathological conditions.

Likewise, the combination of motifs belonging to the HERV-7q family, or of elements induced by motifs belonging to the HERV-7q family, with motifs of exogenous origin or induced exogenously would be

capable of triggering or worsening a pathological process or on the contrary of promoting protection or partial remission or a complete and permanent cure.

5 The detection made possible of the HERV-7q type domains suggests possible applications at the prophylactic, prognostic and diagnostic level; for example, immunological approaches or gene amplification, which make it possible to compare normal individuals serving as reference with patients, would
10 be capable of promoting screening, of improving early detection of the outbreak of the disease and/or of monitoring the progression of a pathological condition in patients which may exhibit a susceptibility or in whom there has been an outbreak of the disease or in
15 individuals considered to be normal, based on current clinical criteria.

The specific nucleic and immunological probes, as defined, in the present invention are capable of promoting the identification and detection of motifs
20 which are abnormally expressed in the context of pathological conditions associated with cancer, or of neuropathological conditions, in particular autoimmune pathological conditions, at the forefront of which is multiple sclerosis.

25 The subject of the present invention is also hybrid nucleic sequences, characterized in that they comprise sequences or motifs belonging to the HERV-7q family, or of elements induced by motifs belonging to the HERV-7q family, with motifs of exogenous origin or
30 induced exogenously (exogenous retroviral sequences); such hybrid sequences are probably capable of triggering or worsening a pathological process or on the contrary of promoting protection or partial remission or a complete and permanent cure.

35 The subject of the present invention is also a diagnostic reagent for the differential detection of complete or partial human endogenous nucleic sequences, having retroviral motifs, selected from the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2, characterized in that

09719554-01301

it is selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate marker as well as of sequences as defined in Figures 18-21.

The sequences of the nucleic, ribonucleic and oligonucleotide probes used will be chosen from the env and gag regions or their flanking regions; for example the oligonucleotide primers for HERV-7q will be chosen from the regions situated between nucleotides 3065 and 4390, nucleotides 6965 and 9550 or nucleotides 2502-2865 of SEQ ID NO: 3, as well as from any adjacent sequence (upstream or downstream) capable of allowing specific amplification (Figure 1).

Among the appropriate markers, there may be mentioned radioactive isotopes, enzymes, fluorochromes, chemical markers (biotin), haptens (digoxigenin) and antibodies or appropriate base analogues.

Preferably:

- said reagent is selected from the sequences SEQ ID NO: 37-57 and is capable of being used as a primer,

- said reagent is selected from the following sequences:

a fragment of 1505 nt amplified by the pair of primers SEQ ID NO: 37 and SEQ ID NO: 38 (primers G1F and G1R),

a fragment of 2529 nt amplified by the pair of primers SEQ ID NO: 45 and SEQ ID NO: 46 (primers E1F and E1R),

a fragment of 182 nucleotides, repeated twice, situated upstream of the *gag* domain at positions 2502-2611/2613-2865,

fragments encoding or not encoding all
5 or part of *env*rin, comprising at least 14 nucleotides and in particular the fragments encoding the C-terminal portion of *env*rin, either from amino acid 291, or from amino acid 321, starting from the first methionine, and is capable of being used as a probe.

10 The subject of the present invention is also a method for the rapid and differential detection of the endogenous retroviral nucleic sequences of the *env* or *env* and *gag* type, their normal or pathological variants, by hybridization and/or gene amplification,
15 carried out using a biological sample, which method is characterized in that it comprises:

(a) a step in which a biological sample to be analysed is brought into contact with at least one probe as defined above, and

20 (b) a step in which the product(s) resulting from the nucleotide sequence-probe interaction is detected by any appropriate means.

In accordance with said method, it may comprise:

25 * prior to step (a):

. a step of preparing the relevant biological tissue or fluid,

. a step of extracting the nucleic acid to be detected, and

30 . at least one gene amplification cycle, and

* subsequent to step (b):

. a step of comparing the nucleic sequences obtained in said biological sample with the human endogenous retroviral sequences according to the
35 invention by any appropriate means and in particular by sequencing, Southern blotting, restriction cleavage, SSCP or any other method which makes it possible to identify an insertion or a deletion or a single mutation between the various sequences compared.

In accordance with the invention, the human endogenous retroviral sequences according to the invention are thus compared with the nucleic sequences present in the biological sample to be analysed and
5 allow the detection of homologous sequences from patients suffering from pathological conditions likely to involve a modification of their genome.

Advantageously, said gene comparisons are carried out using genomic DNA obtained from control
10 individuals and from patients.

A conventional gene amplification by PCR will be carried out with the aid of 5'-sense and 3'-antisense primers delimiting or comprising the zone to be studied (*env* zone or *gag* zone).

Also advantageously, the sequences of the nucleic, ribonucleic and oligonucleotide probes used are chosen from the *env* and *gag* regions or their flanking regions; for example the oligonucleotides which are primers for HERV-7q will be chosen from the
15 regions situated between nucleotides 3065 and 4390 and nucleotides 6965 and 9550, and from any adjacent sequence (upstream or downstream) capable of allowing specific amplification (Figure 1), as specified above. They are preferably selected from the group consisting
20 of

a fragment of 1505 nt amplified by the pair of primers SEQ ID NO: 37 and SEQ ID NO: 38 (primers G1F and G1R),

a fragment of 2529 nt amplified by the pair
30 of primers SEQ ID NO: 45 and SEQ ID NO: 46 (primers E1F and E1R).

The gene amplification step is in particular carried out with the aid of one of the following gene amplification techniques: amplification using
35 Q β -replicase, PCR, LCR, ERA, CPR or SDA.

The subject of the present invention is also chimeric sequences, characterized in that they consist of a fragment of 17 to 40 nucleotides of a flanking sequence as defined above combined with an endogenous

retroviral motif of the HERV-7q type comprising between 17 and 40 nucleotides, as defined above.

The subject of the present invention is also a method of detecting transcripts as defined above, characterized in that it comprises:

- collecting messenger RNAs obtained from control biological samples (biological tissues, cells or fluids) and from a similar sample collected from patients, and

- the qualitative and/or quantitative analysis of said mRNAs by *in situ* hybridization, by dot-blot, Northern blotting, RNase mapping or RT-PCR, with the aid of a diagnostic reagent as defined above.

The subject of the present invention is also a method for the detection and/or evaluation of an overexpression/underexpression or of a modification of at least one of the endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or of their associated flanking sequences, characterized in that it comprises:

- depositing on an appropriate support, such as for example a nylon filter, a glass slide or their equivalent, cDNA or its equivalent obtained from clones, PCR products obtained from genomic DNA, RT-PCR products obtained from transcripts or from specific oligonucleotide sequences, said DNA sequences being endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or their flanking sequences, as defined above, consisting of transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/deregulation of motifs belonging to said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of said HERV-7q family and in

which one of the ends cannot be at a distance exceeding 120 kb, and/or a chimeric sequence as defined above,

- the hybridization of said support with at least one appropriately labeled probe obtained, for example, by retrotransposition of an RNA mixture obtained from biological cells, tissues or fluids obtained from controls reputed to be normal, from members of various ethnic populations, from patients suffering from pathological conditions often associated with expression of retroviruses, such as tumor processes, or such as autoimmune diseases, and
- the detection of the hybrids formed.

According to an advantageous embodiment of said method, said transcript or cDNA is selected from the group consisting of the sequences SEQ ID NO: 62-67 and 119 and their fragments corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences.

According to another advantageous embodiment of said method, said support comprises, in addition, any endogenous or exogenous retroviral sequence.

The method of DNA chips (Bowtell, (1999), Nature Genet., 21, 25-32), is used to evaluate the modification of the expression of all or part of some of the sequences of retroviral origin of the HERV-7q type and flanking sequences. Briefly, DNA obtained from clones, PCR products obtained from genomic DNA, RT-PCR products obtained from transcripts or specific oligonucleotide sequences are deposited on a support, such as for example a nylon filter, a glass slide or their equivalent. The deposited nucleic sequences cover the various retroviral domains described above, as well as the contiguous sequences and the flanking genes. In order to detect possible alternative splicing processes, specific DNAs are synthesized per step of 500-600 nucleotides with an overlap of 250-300 nucleotides on either side. The alternative splicings already identified will be the subject of a specific synthesis. The hybridization is carried out with the

aid of a probe obtained, for example, by retrotransposition of an RNA mixture obtained from biological cells, tissues or fluids obtained from controls reputed to be normal, members of the various ethnic populations, patients suffering from pathological conditions often associated with expression of retroviruses, such as tumor processes, or such as autoimmune diseases, including multiple sclerosis. In this case, a μg fraction and up to a few μg of mRNA or up to a few μg or a few tens of μg of RNA, depending on the method used and the size of the DNA chip involved, are sufficient for the synthesis of the nucleic probe. The nucleic probe is suitably labeled so as to allow subsequent detection, such as for example by fluorescence or by an equivalent method.

The use of bi- or even multicolored probes makes it possible to specify the concerted expression of several genes in parallel, while taking advantage, furthermore, of a precise normalization. The results are acquired automatically, such as for example by a laser scanning system or its equivalent.

Two types of DNA chips are designed, on the one hand chips having an exhaustive set of sequences, and on the other hand specific DNA chips enabling targeting to a more specific application.

For example, a critical sequence in that it would contain a difference relating to a deletion or even a mutation is detected with the aid of specific oligonucleotides (Wang et al., (1998), Science, 280, 1077-1082). The polymorphism associated with a base or with a mutation is detected with the aid of four oligonucleotides possessing one of the four sequence possibilities at the level of a base (A, C, G or T); for each point difference, the 4 oligonucleotides are deposited and the hybridization intensities are compared. Furthermore, an alternative splicing is detected using DNAs corresponding to a single effective or putative exon; the gene is therefore analyzed exon by exon. The DNA chips also relate, by extension, to

any endogenous or exogenous retroviral sequence, such as for example ERV-9, ERV-K, ERV-L, ERV-H, ERV-4, ERV-6, ERV-8, ERV-10, ERV-15, ERV-16, ERV-17, ERV-18, ERV-21, ERV-24, ERV-33, ERV-34, ERV-36, ERV-40, ERV-42, 5 ERV-MLN, ERV-FRD, ERV-FTD and the like), as well as all the putative exon sequences (identified by the existence of sequence tags and corresponding transcripts) or effective exon sequences, and which are situated on either side up to a distance of 120 kb of 10 the endogenous retroviral sequences of the HERV-7q type.

The comparative study is carried out between a control sample and the sample to be tested, in a prophylactic, diagnostic or therapeutic perspective, 15 such as for example the early detection of a modification of the expression of one of the sequences, in a cell, a tissue or an organism, the identification of a sequence associated with a susceptibility or with any pathological condition, the monitoring of the 20 progression of the pathological condition or the monitoring of a treatment and the evaluation of its efficacy.

Apart from the applications already mentioned, the advantage of the method makes it possible, more 25 generally, to make an assessment of the changes observed in an individual, which constitutes to a certain extent an identity card, which facilitates an epidemiological approach which makes it possible to establish novel correlations between a particular 30 observed profile and a pathological condition, in the absence of an *a priori* regarding this pathological condition.

The subject of the present invention is also a kit for the detection and/or evaluation of an auto- 35 immune disease and in particular of neuropathological conditions with an autoimmune etiology, characterized in that it comprises, in addition to the buffers necessary for carrying out the methods as defined above:

- diagnostic reagents A as defined above, and
- reagents B consisting of the transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/de-regulation or alteration is associated with the normal or pathological expression or with the regulation/de-regulation of motifs belonging to said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of said HERV-7q family, of which one of the ends cannot be at a distance exceeding 120 kb,
- which reagents are preferably attached to an appropriate support.

- According to an advantageous embodiment of said kit, said reagents B are selected from the group consisting of the sequences SEQ ID NO: 62-67 and 119 and their fragments corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, as well as the sequences represented in Figures 13-17, 22-26.

- The subject of the present invention is also products of translation, characterized in that they are encoded by a nucleotide sequence as defined above.

- The subject of the present invention is also a peptide, characterized in that it is capable of being expressed with the aid of a nucleotide sequence selected from the group consisting of the sequences SEQ ID NO: 1-22, 28 and 61, as defined above, according to the combinations offered by the use of the various possible reading frames (see also Figures 18-21).

- Said peptide also includes the derived peptides or polypeptides comprising between 5 and 540 amino acids (SEQ ID NO: 23-36 and SEQ ID NO: 58 and their fragments of at least 5 amino acids) and in particular a fragment of 538 amino acids, starting at the first methionine of the sequence SEQ ID NO: 26 (enverin).

- According to an advantageous embodiment of said peptides they are in particular selected from the

sequences SEQ ID NO: 23-36, 58, in particular the sequence SEQ ID NO: 26 and its C-terminal fragments, either from the amino acid 291, or from the amino acid 321, starting from the first methionine.

5 According to another advantageous embodiment of said peptides, they are obtained from nucleic sequences as defined above, in which at least one non-sense codon may be replaced with a codon encoding one of the following amino acids: Phe (F), Leu (L), Ser (S), Tyr (Y), Cys (C), Trp (W), Gln (Q), Arg (R), Lys (K), Glu (E) or Gly (G).

15 The invention thus includes the deduced peptides or the deduced proteins corresponding to all or part of the nucleic sequences described in the invention, and optionally exhibiting modifications with the reference sequences described in the invention, when they are expressed in some patients. In particular, the invention includes the complete or partial sequences obtained according to the 3 sense reading frames and the 3 reverse and complementary reading frames (see Figures 18-21).

Advantageously, the analysis of the structure of the env domain of HERV-7q, called enverin, made it possible to demonstrate successively:

25 - an N-terminal signal peptide (region 1-21) and two transmembrane domains (region 320-340; 455-477), responsible for interactions with membrane lipid or protein motifs,

30 - an immunomodulatory motif of the CKS-17 (Haraguchi et al., (1995), 92, 5568-5571)/CKS-25 type. It is possible to note, in this regard, the presence of an **RaId** motif inside the peptide of the CKS-17/CKS-25 type of HERV-7q and a motif **RvaD** at position 363 which correspond to the consensus W/RxxD, proposed for the active site of the TGF- β s (Huang et al., J. Biol. Chem., 1997, 272, 27155-27159), potent factors associated with growth, with differentiation and with morphogenesis and which are associated with many human pathological conditions, such as tumor processes (Tang

et al., (1998), Nat. Med., 4, 802-807) or neuro-degenerative diseases (Flanders et al., (1998), Prog. Neurobiol., 54, 71-85). The peptides according to the invention containing these motifs can advantageously
5 serve as antagonists by inhibiting the attachment of the TGF- β s to their natural receptors,

- N-glycosylation motifs. The glycosylation of the envelope proteins of retroviruses appears to be directly associated with their functional properties,
10 for example by influencing the number of determinants available in the T cells or by promoting recognition of antigens by the T cells. Glycosylation could play a role in the outbreak or the spread of a pathological condition with an autoimmune component. The
15 glycosylations are necessary for maintaining the conformation of certain epitopes, in particular during the production of a recombinant envelope protein so as to develop a diagnostic reagent and to promote the efficacy of a possible vaccine. Positions 171, 210,
20 216, 236, 244, 283 and 411. Expected number at random: 3.2

- prenylation sites. Prenylation is an essential mechanism for attachment to the cell membrane and for the targeting of certain proteins. This
25 targeting process could be essential for the production of specific therapeutic agents capable of interfering with the production and regulation of the traffic of cellular complexes calling into play proteins involved in the cell interactions, growth and movement.
30 Positions 188 and 290. Expected number at random: 1.8

- targeting sites in the endoplasmic reticulum. These sites could make it possible to bring about the targeting toward the endoplasmic reticulum in order to carry out the modifications necessary for promoting
35 membrane crossing. Positions 353 and 431. Expected number at random: 0.2

Moreover, the inventors have shown that a number of peptides derived from the env protein of HERV-7q (enverin) have a high affinity/half-life for

the class I HLA alleles. CADD analysis has made it possible to select candidate peptides, for which the best scores are indicated in Table I:

5

TABLE I

Location	Sequence	HLA molecule	Score	Sequence No.
399	FLGEECCYYV	A-0201	7214	SEQ ID NO: 68
462	LLFGPCIFNL	A-0201	1792	SEQ ID NO: 69
189	CLPLNFRPYV	A-0201	1453	SEQ ID NO: 70
439	GLLSQWMPWI	A-0201	488	SEQ ID NO: 71
263	CLPSGIFFV	A-0201	5103	SEQ ID NO: 72
444	WMPWILPFL	A-0201	897	SEQ ID NO: 73
252	IRWVTPPTQI	B-2705	3000	SEQ ID NO: 74
432	LRNTGPGWLL	B-2705	2000	SEQ ID NO: 75
158	LRTHTRLVSL	B-2705	2000	SEQ ID NO: 76
316	KRVPILEFVI	B-2705	1800	SEQ ID NO: 77
25	CRCMTSSSPY	B-2705	1000	SEQ ID NO: 78
137	TRVHGTSSPY	B-2705	1000	SEQ ID NO: 79
124	AREKHVKEVI	B-2705	600	SEQ ID NO: 80
478	SRIEAVKLQM	B-2705	600	SEQ ID NO: 81
442	SQWMPWILPF	B-2705	500	SEQ ID NO: 82
405	CYYVNQSGI	Kd	2400	SEQ ID NO: 83
346	FYYKLSQEL	Kd	2400	SEQ ID NO: 84
244	TYTINSQCI	Kd	2400	SEQ ID NO: 85
291	SFLVPPMTI	Kd	1600	SEQ ID NO: 86
406	YYVNQSGIV	Kd	1200	SEQ ID NO: 87
167	LFNTTLTGL	Kd	1152	SEQ ID NO: 88
463	LFGPCIFNL	Kd	960	SEQ ID NO: 89
253	RWVTPPTQI	Kd	480	SEQ ID NO: 90
449	LPFLGPLAAI	B-5102	2200	SEQ ID NO: 91
3	LPYHIFLFTV	B-5102	1210	SEQ ID NO: 92
331	GALGTGIGGI	B-5102	798	SEQ ID NO: 93
321	LPFVIGAGVL	B-5102	550	SEQ ID NO: 94
499	RRPLDRPAS	B-2705	600	SEQ ID NO: 95
194	FRPYVSIPV	B-2705	600	SEQ ID NO: 96
383	RRALDLLTA	B-2705	600	SEQ ID NO: 97
39	WRMQRPNGI	B-2705	600	SEQ ID NO: 98
423	DRIQRAEEL	B14	1800	SEQ ID NO: 99
158	LRTHTRLVSL	B14	600	SEQ ID NO: 100
359	ERVADSLVTL	B14	540	SEQ ID NO: 101
463	LFGPCIFNLL	Kd	1658	SEQ ID NO: 102
345	QFYYKLSQEL	Kd	1152	SEQ ID NO: 103
443	QWMPWILPFL	Kd	691	SEQ ID NO: 104
405	CYYVNQSGIV	Kd	500	SEQ ID NO: 105
474	NFVSSRIEAV	Kd	480	SEQ ID NO: 106
221	GPLVSNLEI	B-5102	1320	SEQ ID NO: 107
190	LPLNFRPYV	B-5102	726	SEQ ID NO: 108
449	LPFLGPLAAI	B-5101	1144	SEQ ID NO: 109
488	EPKMQSKTKI	B-5101	968	SEQ ID NO: 110
3	LPYHIFLFTV	B-5101	629	SEQ ID NO: 111
125	REKHVKEVI	Kk	1000	SEQ ID NO: 112
312	KPRNKRVPIL	B7	800	SEQ ID NO: 113
378	VVLQNRRL	Db	792	SEQ ID NO: 114

09714554.014804

Location	Sequence	HLA molecule	Score	Sequence No.
377	AVVLQNRRL	Db	660	SEQ ID NO: 115
321	LPFVIGAGV	B-5101	629	SEQ ID NO: 116
304	DLYSYVISK	A3	540	SEQ ID NO: 117
301	TEQDLYSYVI	Kk	500	SEQ ID NO: 118

This Table I indicates an estimation of the dissociation half-life of a peptide of enverin with an allele of the class I HLA system (the tables of Parker coefficients: J. Immunol, (1994), 152, 163-175). The location indicates the position of the first amino acid of the peptides tested in the enverin sequence. The one-letter code is used for the amino acid sequence. The scores around 500 or greater than 500 were selected. By way of comparison, an analysis was carried out on a concatenation of peptides (polypeptide of 4968 amino acids) reputed to bind the molecules of the class I major histocompatibility complex (Rammensee, Immunogenetics, (1995), 41, 178-228); the ten best scores recorded for nonapeptides and the HLA type A_0201 are respectively 4984, 4047, 2406, 1267, 800, 705, 607, 591, 591 and 577.

It can be seen from this Table I that some molecules of the type I major histocompatibility complex are capable of binding peptides derived from enverin, thus assimilated with peptides of viral or tumor origin, at the level of the endoplasmic reticulum. The complexes formed at the level of the endoplasmic reticulum are then transported to the cell surface, which causes the destruction of the target cell by the cytotoxic T lymphocytes. The peptides identified generally comprise 8 to 10 amino acids. Studies have shown that some alleles of the class I HLA system are thus associated with certain pathologies, in particular with an autoimmune character, such as HLA-B27 with rheumatoid spondylitis or HLA-B51 with Behçet's disease.

A peptide capable of binding a particular class I molecule is consequently capable of functioning as a T cell epitope.

Consequently, the present invention also includes the fragments 399-471 and 244-271 of enverin which advantageously group together several epitopes having high affinity for various haplotypes of the class I HLA system. The use of all or some of these polypeptides is consequently capable of promoting an increase in the T cell repertoire, by allowing better efficacy of the immune response in the context of the various immunotherapeutic, prophylactic or vaccine strategies. These polypeptides may be advantageously delivered for example by the use of viral vectors, viral or synthetic particles, lipopeptides, conventional adjuvants, naked nucleic acids or nucleic acids adsorbed on particles, or liposomes.

For the purposes of the present invention, the peptides may be chemically or biochemically modified; some of the amino acids may be replaced with an analogous amino acid, according to conventional criteria for homologies (A or G; S or T; I, L or V; F, Y or W; N or Q; D or E).

The subject of the present invention is also immunogenic or vaccine compositions for protecting against autoimmune diseases, in particular in at-risk subjects, characterized in that it comprises at least one peptide comprising at least one motif of the CKS type and/or at least one peptide consisting of a motif having affinity with one of the haplotypes of the class I or class II HLA system and a pharmaceutically acceptable vehicle.

According to an advantageous embodiment of said composition, said motif is selected from the group consisting of peptides, as defined in Table I above.

According to another advantageous embodiment of said composition, said peptide has the following sequence:

sequence CKH: LQNRRLDLLTAERGGTclFLGECCYYV
(SEQ ID NO: 120).

It is remarkable to note at the level of position 380 of the enverin protein, the contiguousness

03716541.01304
100110155766

of the motifs of the CKS-17 type (underlined) and of the peptide having the highest score (in bold; see peptide at position 399 in Table I, SEQ ID NO: 68) in the sequence CKH.

5 The clonal activation of the subgroups of lymphocytes, for example of cytotoxic lymphocytes, by the peptides in Table I and by extension their homologues, is blocked by conventional immunotherapy means such as for example serotherapy and vaccination.

10 The combination of two sequences or of the sequences analogous to the CKH peptide (SEQ ID NO: 120), is capable of causing a synergistic process in the immune response, which could bring into play additional signaling and activation pathways
15 capable of modulating the lymphocyte activation.

 The vaccination relates to the production of antibodies directed against the peptides of Table I, according to the rules of the prior art and according to the methods of release controlled by artificial or
20 cellular implants using a composition as defined above and by using gene therapy means, such as for example expression of nucleic sequences encoding the peptides of Table I. Consequently, the subject of the invention is also immunogenic or vaccine compositions,
25 characterized in that they comprise a vector including at least one nucleic sequence encoding a peptide as defined in Table I, optionally combined with a sequence encoding a motif of the CKS-17 type.

 The serotherapy relates to the use of
30 neutralizing antibodies produced from the peptides of Table I and their homologues.

 The protein products generated by the endogenous retroviral sequences or produced in parallel may be advantageously characterized by micro-methods of
35 analysis and quantification of peptides and proteins: HPLC/FPLC or equivalent, capillary electrophoresis or equivalent, microsequencing techniques (Edman method or equivalent, mass spectrometry and the like).

The subject of the invention is also antibodies directed against one or more of the peptides described above and their use either for carrying out a method, in particular a differential method, of *in vitro* detection of the presence of such a sequence in an individual, or for the preparation of a composition capable of being used in serotherapy in neuropathological conditions with an autoimmune component.

Said antibodies are advantageously polyclonal or monoclonal antibodies obtained by an immunological reaction from a human, mammalian or avian organism or other species toward the proteins, as defined above.

The subject of the present invention is a method for the differential immunological screening of normal or pathological human endogenous retroviral sequences of the HERV-7q family, characterized in that it comprises bringing a biological sample into contact with an antibody according to the invention, the reading of the result being visualized by an appropriate means, in particular EIA, ELISA, RIA, fluorescence.

By way of illustration, such an *in vitro* diagnostic method according to the invention comprises bringing a biological sample collected from a patient into contact with antibodies according to the invention and detecting with the aid of any appropriate method, in particular with the aid of labeled anti-immunoglobulins, the immunological complexes formed between the proteins produced normally or pathologically and the antibodies.

Monoclonal or polyclonal antibodies, produced from antigens corresponding to synthetic peptides, or recombinant polypeptide or proteins make it possible to monitor the expression of the peptides or proteins produced normally or pathologically. The analysis is preferably carried out by ELISA or equivalent, Western blotting or equivalent, or by immunohistochemistry.

The peptides or proteins, derived from the endogenous retroviral sequences or whose expression is associated with the expression of these endogenous retroviral sequences, are tested for and identified.

5 The subject of the present invention is also a method for the identification and detection of endogenous retroviral motifs which are abnormally expressed in the context of pathological conditions associated with cancer, or of neuropathological
10 conditions, in particular autoimmune neuropathological conditions, at the forefront of which is multiple sclerosis, characterized in that it comprises the comparative analysis of the sequences extracted from a biological sample and the sequences according to the
15 invention.

 The subject of the present invention is also the application of the nucleic sequences or of the protein sequences according to the invention to the diagnosis of, to the prognosis of, to the evaluation of
20 genetic susceptibility to, any induced, congenital or acquired human diseases, in particular those with cancerous, autoimmune and/or neurological components, such as multiple sclerosis, the associated syndromes and the neurodegenerative diseases in which all or part
25 of the nucleic sequences according to the invention and related endogenous or exogenous forms are involved.

 The subject of the present invention is also hybrid nucleic sequences, characterized in that they comprise nucleic sequences or motifs according to the
30 invention, combined with sequences or motifs of endogenous origin or of exogenous origin or induced exogenously.

 The subject of the present invention is, in addition, a recombinant cloning or expression vector,
35 characterized in that it comprises a nucleic sequence in accordance with the invention.

 Therapeutic strategies may be envisaged by using some of the nucleic sequences contained in HERV-7q and the sequences of the same family or deduced

00719554-01000

polypeptide structures or by the use of peptides or proteins, or of specific antibodies.

In accordance with the invention, all or part of the endogenous retroviral nucleic sequences of the
5 HERV-7q type may be used for use as a vector or as vector elements for therapeutic use, in particular the LTR sequences and the gag region (SEQ ID NO: 2, 21 and 22).

The advantage of such sequences lies in the
10 safety of the vector thus formed, in the possibility of a targeted specific insertion in a well-defined region by a strategy similar to homologous recombination, in cellular targeting, which is optionally transient in the case of a placental expression in women. Another
15 aspect relates to the possibility of combining with the genes of interest the biologically active retroviral motifs (immunomodulatory peptides, as represented in the sequences SEQ ID NO: 68-118, below, fusogenic peptide and the like).

20 The subject of the present invention is also transgenic animals, characterized in that they comprise all or part of a sequence of the HERV-7q type (SEQ ID NO: 1-22 and 61).

Table II below establishes the correspondences
25 between the sequence numbers as they appear in the sequence listing and the name of the various sequences.

TABLE II

SEQ ID NO:	DESIGNATION
1	Nucleic acid: 7 env
2	Nucleic acid: gag
3	Nucleic acid: HERV-7q
4	Nucleic acid: HE2
5	Nucleic acid: HE3
6	Nucleic acid: HG3
7	Nucleic acid: HE4
8	Nucleic acid: HE5
9	Nucleic acid: HE6
10	Nucleic acid: HG6
11	Nucleic acid: HE7
12	Nucleic acid: HE8
13	Nucleic acid: HG8
14	Nucleic acid: HE9
15	Nucleic acid: HE10
16	Nucleic acid: HE11
17	Nucleic acid: HG11
18	Nucleic acid: HE12
19	Nucleic acid: HG12
20	Nucleic acid: R1
21	Nucleic acid: R1F
22	Nucleic acid + deduced env protein: HERV-7q
23	Fragment of deduced env protein according to SEQ ID NO: 22
24	Fragment of deduced env protein according to SEQ ID NO: 22
25	Fragment of deduced env protein according to SEQ ID NO: 22
26	Protein: enverin
27	Fragment of deduced env protein according to SEQ ID NO: 22
28	Nucleic acid + protein deduced from gag: HERV-7q
29	Fragment of deduced gag protein according to SEQ ID NO: 28
30	Fragment of deduced gag protein according to SEQ ID NO: 28
31	Fragment of deduced gag protein according to SEQ ID NO: 28
32	Fragment of deduced gag protein according to SEQ ID NO: 28
33	Fragment of deduced gag protein according to SEQ ID NO: 28
34	Fragment of deduced gag protein according to SEQ ID NO: 28
35	env protein: reading frame 1
36	gag protein
37	Nucleic acid: G1F (primer)
38	Nucleic acid: G1R (primer)
39	Nucleic acid: G2F (primer)
40	Nucleic acid: G2R (primer)
41	Nucleic acid: G4F (primer)
42	Nucleic acid: G3F (primer)
43	Nucleic acid: G4R (primer)
44	Nucleic acid: G5R (primer)
45	Nucleic acid: E1F (primer)
46	Nucleic acid: E1R (primer)
47	Nucleic acid: E2F (primer)
48	Nucleic acid: E2R (primer)
49	Nucleic acid: E3F (primer)
50	Nucleic acid: E3R (primer)
51	Nucleic acid: E4F (primer)

SEQ ID NO:	DESIGNATION
52	Nucleic acid: E4R (primer)
53	Nucleic acid: E5F (primer)
54	Nucleic acid: E6F (primer)
55	Nucleic acid: E5R (primer)
56	Nucleic acid: ExF (primer)
57	Nucleic acid: ExR (primer)
58	Protein gag
59	Nucleic acid: Sequence A (insertion sequence)
60	Nucleic acid: Sequence B (insertion sequence)
61	Nucleic acid: HE13
62	Nucleic acid: RH7
63	Nucleic acid: RAM75
64	Nucleic acid: RAV73
65	Nucleic acid: RBP3
66	Nucleic acid: HI3
67	Nucleic acid: LTX
68	Peptide Table I
69	Peptide Table I
70	Peptide Table I
71	Peptide Table I
72	Peptide Table I
73	Peptide Table I
74	Peptide Table I
75	Peptide Table I
76	Peptide Table I
77	Peptide Table I
78	Peptide Table I
79	Peptide Table I
80	Peptide Table I
81	Peptide Table I
82	Peptide Table I
83	Peptide Table I
84	Peptide Table I
85	Peptide Table I
86	Peptide Table I
87	Peptide Table I
88	Peptide Table I
89	Peptide Table I
90	Peptide Table I
91	Peptide Table I
92	Peptide Table I
93	Peptide Table I
94	Peptide Table I
95	Peptide Table I
96	Peptide Table I
97	Peptide Table I
98	Peptide Table I
99	Peptide Table I
100	Peptide Table I
101	Peptide Table I
102	Peptide Table I
103	Peptide Table I
104	Peptide Table I
105	Peptide Table I

2025-04-15 14:56:22

SEQ ID NO:	DESIGNATION
106	Peptide Table I
107	Peptide Table I
108	Peptide Table I
109	Peptide Table I
110	Peptide Table I
111	Peptide Table I
112	Peptide Table I
113	Peptide Table I
114	Peptide Table I
115	Peptide Table I
116	Peptide Table I
117	Peptide Table I
118	Peptide Table I
119	Nucleic acid: BLIMP-1
120	Peptide: CKH
121	Nucleic acid: F645 (primer)
122	Nucleic acid: PSSD (primer)

In addition to the preceding arrangements, the invention also comprises other arrangements which will emerge from the description which follows, which refers to exemplary embodiments of the method which is the subject of the present invention as well as to the appended drawings, in which:

- Figure 1. Human nucleic sequence HERV-7q, whose analysis and treatment make it possible to characterize a novel endogenous retroviral structure. The repeat nucleic regions of type R1 and R2 and the gag, pol and env domains are underlined. The gag and env type domains are in italics. The region homologous to a noncoding 3' portion of Rab7 is double underlined.

- Figure 2. Map of the human endogenous retroviral region HERV-7q. The upper part of the figure corresponds to an anonymous region of the human genome situated on the long arm of chromosome 7. The repeat domains (1), gag (2), pol (3) and env (4) of HERV-7q can be identified. The C-terminal env region (4.3) is prolonged upstream in the form of a long open reading frame (4.2). The domain 4.1 corresponds to the N-terminal region of the env domain.

- Figure 3. Comparison of the repeat nucleic sequences situated at the boundaries of HERV-7q. The 5'

(top) and 3' (bottom) repeat nucleic regions are compared and the identical bases are indicated by two dots.

- Figure 4. Deduced sequence having an open
5 reading frame in the env-type domain of HERV-7q according to the longest open reading frame rule.

- Figure 5. Sequences around the CKS-17 domain identified in various deduced env domains of the HERV-7q family and comparison with reference CKS-17
10 motifs.

1) HE2 - 2) HERV-7q - 3) GenBank accession No.: M85205 - 4) HE7 - 5) HE9 - 6) CKS-17; the peptide motif endowed with immunomodulatory properties is underlined - 7) gp20 of retrovirus type D (SRV-Pc).

- Figure 6. Possible deduced sequence of the gag-type domain identified in HERV-7q established according to the longest open reading frame rule. X and / correspond to a non-sense codon and to a reading frame shift, respectively. The underlined sequence
15 corresponds to the beginning of the pol domain.

- Figure 7. Comparison of the nucleic regions covering the gag region of HERV-7q (top) and HERV-TcR (bottom) and their flanking regions. The identical bases are specified by two dots.

- Figure 8. Example of nucleic alignments of the env-type domain of HERV-7q with similar env-type domains present in human endogenous retroviral sequences of the same family. The non-sense codons are underlined: 1) HERV-7q - 2) HE2 03) HE3 - 04) HE4.
25

- Figure 9. Nucleic alignments between the gag domain of HERV-7q and the corresponding domains belonging to the same family. Comparison with fragments of gag domains isolated from infectious retroviral agents. Sequences of infectious retroviral origin: EMBL
30 database accession No.: 1) A60168 - 2) A60201 - 3) A60200 - 4) A60171. Human endogenous retroviral sequences: 5) HERV-7q - 6) HG11 - 7) HG3. The figures indicated in the endogenous sequences correspond to the number of nucleotides inserted in order to optimize the
35

alignment with the *gag*-type sequences identified in retroviruses of infectious origin.

- Figure 10. Alignment of a deduced *gag* protein motif (top) belonging to an infectious retrovirus (EMBL accession No.: A60200) with the deduced *gag* protein motif (bottom) identified in HERV-7q. The non-sense codons are in bold and underlined. The identical amino acids are specified by 2 dashes. One dash indicates a deletion or a homologous amino acid.

- Figure 11. Alignment of an *env* motif (top) belonging to an infectious retrovirus (EMBL accession No.: A60170) with the *env* motif (bottom) identified in HERV-7q. The homologous nucleotides are specified by two dots and the deletions by a dash.

- Figure 12. Comparison between the *env* domain of HERV-7q (top) and the *env* domain of HERV-9 (bottom). The 66% homology is limited to the 3' region of the *env* domain of HERV-7q and HERV-9, respectively between nucleotides 8976 nt and 9500 nt of HERV-7q and nucleotides 2898 nt and 3465 nt of HERV-9 (GenBank accession No.: X57147). Numerous insertions/deletions are also observed.

- Figure 13. Homology between a portion of the sequence of the transcript encoding RH7 (top, SEQ ID NO: 62) and an RGH2 motif (bottom - GenBank accession No.: D11018).

-Figure 14. Identification of the sequence of the transcript encoding RAM75 (SEQ ID NO: 63), corresponding to the gene for an ATPase of PEX1 type. The coding exons are underlined. The initiation and non-sense codons as well as the putative polyadenylation sites are in bold and underlined. The region in italics corresponds to the beginning of the endogenous retroviral sequence RH7.

- Figure 15. Sequence of the transcript encoding RAV73 (SEQ ID NO: 64), situated at 0.7 kb downstream of HERV-7q; the nucleic sequences capable of encoding one or more polypeptides are underlined.

- Figure 16. Comparison between the 3' LTR sequence (top) of HERV-7q and the intron sequence LTX (SEQ ID NO: 67), situated in the FMR2 gene, associated with fragile X (bottom).

5 - Figure 17. Detection of modifications on the nucleotide sequence (ID NO: 3), in patients suffering from MS. The modified bases, in at least one patient, are underlined. The primers used are in italics (sequences SEQ ID NO: 121 and 122). The initiation ATG and the non-sense codon are in bold.

10 - Figure 18. The env coding portion of the HERV-7q sequence (sequence ID NO: 3), with 3 reading frames.

15 - Figures 19, 20, 21. Separate presentation of the env protein according to the 3 reading frames.

20 - Figure 22. Nucleic sequence containing the retroviral sequence RH7 situated in 5' of the HERV-7q sequence. The sequence in italics corresponds to the beginning of the HERV-7q sequence. The RH7 sequence is underlined. Two putative polyadenylation sites are in bold.

25 - Figure 23. Sequence of the transcript encoding RBP3 containing nucleotide motifs identified in the nucleic sequence encoding the Blimp-1 gene.

 - Figure 24. Sequence of the transcript encoding APS.

 - Figure 25. Sequence of the transcript encoding Blimp-1; the coding portion is underlined; the initiation and termination codons are in bold.

30 - Figure 26. Sequence of the transcript encoding FMR2. The coding portion is underlined. The initiation and non-sense codons are in bold.

 It should be clearly understood, however, that these examples are given solely by way of illustration
35 of the subject of the invention and do not in any manner constitute a limitation thereto.

EXAMPLE 1: Detection, by gene amplification, of a nucleic sequence belonging to a domain of the gag or env type according to the invention, in a genomic DNA sample of human or mammalian origin

5 The gene amplification is carried out using genomic DNA isolated from blood. An anticoagulant treatment is carried out with 1 ml of a citrate solution (per liter: 4.8 g of citric acid, 13.2 g of sodium citrate, 14.7 g of glucose) per 6 ml of fresh
10 blood. After centrifugation of 20 ml of blood for 15 min at 130 000 g, the supernatant is removed and the fraction enriched with white blood cells is transferred into a new tube and then recentrifuged under the same conditions as above. The fraction enriched with white
15 blood cells is resuspended in an extraction buffer (10 nM Tris-HCl, 0.1 M EDTA, 20 µg/ml of pancreatic RNase treated so as to eliminate the DNases, 0.5% SDS, pH 8.0), and then incubated for 1 hour at 37°C. Proteinase K is added at a final concentration of
20 100 µg/ml. The suspension of lyzed cells is incubated at 50°C for 3 hours, with occasional stirring, and then treated with an equal volume of phenol equilibrated with 0.5 M Tris-HCl, pH 8.0. The emulsion formed is placed on a wheel for one hour and then centrifuged at
25 5 000 g for 15 min at room temperature. The aqueous solution is treated and deproteinized by a triple phenol extraction in order to obtain a level of purification corresponding to an absorbance A260/A280 final ratio greater than 1.75. The aqueous fraction is
30 precipitated with 0.2 vol. of 10 M sodium acetate and 2 vol. of ethanol. The DNA is then either collected with the tip of a bent Pasteur pipette, or centrifuged at 5 000 g for 5 min at room temperature. The DNA or the DNA pellet is washed twice with 70% ethanol and
35 then taken up in 1 ml of TE, pH 8.0 so as to be eluted, with gentle stirring, for 12 to 24 hours.

Oligonucleotides specific for the endogenous sequences described according to the invention are chosen in order to amplify the gag or env region of the

endogenous retroviral regions described according to the invention. The genomic DNA studied is obtained from patients having pathological conditions such as multiple sclerosis and from individuals reputed to be healthy.

The thermostable DNA polymerases used were chosen for their high accuracy during the amplification process, such as Vent DNA polymerase (Biolabs) and the like, and are used according to the conditions recommended by the supplier.

The amplification strategy uses, depending on the case, a simple PCR, or a nested or seminested PCR.

Oligonucleotides used to amplify the *gag* region:

- primer G1F, sense, located in the region upstream of the *gag* domain of *HERV-7q* (SEQ ID NO: 37),
- primer G1R, antisense, located in the 3' terminal region of the *gag* domain (SEQ ID NO: 38).

The fragment of 1505 nt amplified by the pair G1F-G1R; 1505 nt is used to generate the probes capable of hybridizing the various PCR amplification products.

- primer G2F, sense nested (SEQ ID NO: 39),
- primer G2R, antisense nested (SEQ ID NO: 40),
- primer G4F, sense nested (SEQ ID NO: 41),
- primer G3F, sense nested (SEQ ID NO: 42),
- primer G4R, antisense nested (SEQ ID NO: 43),
- primer G5R, antisense nested (SEQ ID NO: 44).

Oligonucleotides used to amplify the *env* region of *HERV-7q*:

- primer E1F, sense (SEQ ID NO: 45),
- primer E1R, antisense (SEQ ID NO: 46).

The fragment of 2529 nt amplified by the pair of primers E1F-E1R is used to generate the probes capable of hybridizing the various PCR amplification products.

- primer E2F, sense (SEQ ID NO: 47),
- primer E2R, antisense (SEQ ID NO: 48),
- primer E3F, sense (SEQ ID NO: 49),
- primer E3R, antisense (SEQ ID NO: 50),

- primer E4F, sense (SEQ ID NO: 51),
- primer E4R, antisense (SEQ ID NO: 52),
- primer E5F, sense (SEQ ID NO: 53),
- primer E6F, sense (SEQ ID NO: 54),
- 5 - primer E5R (SEQ ID NO: 55),
- primer ExF (SEQ ID NO: 56),
- primer ExR (SEQ ID NO: 57).

The PCR is carried out using 50 to 200 ng of genomic DNA. The PCR conditions are those recommended
10 by the supplier. The amplification cycle conditions are carried out in 50 μ l: denaturation of 94°C for 1 min, hybridization of 70°C for 1 min, and extension at 72°C for 1 to 2 min, depending on the amplified fragments. After 35 cycles, a terminal reaction is carried out at
15 72°C for 10 min. Automated sequencing of the amplified samples is carried out with the aid of an Applied Biosystems type ABI 377 sequencer or another comparable model, according to the protocols provided by the manufacturer.

20 In the case of a nested or seminested PCR, the same experimental conditions are used, the only difference being that the genomic DNA sequence is replaced with 5 to 10 μ l of the amplification product derived from the first PCR.

25 Two independent amplifications are carried out using the same sample. A control reaction is carried out by replacing the DNA sample with water in order to detect possible contaminants.

EXAMPLE 2: Detection, by gene amplification, of a
30 nucleic sequence according to the invention in a biological sample of genomic DNA collected from patients having an existing candidate pathological condition or suspected of having this pathological condition

35 The amplification protocol is the same as in Example 1, apart from the origin of the sample which is obtained from patients having a candidate pathological condition. A genomic DNA sample reputed to be normal is

systematically integrated into the set of amplified pathological samples and then analyzed.

The PCR products are separated on a 1.5% agarose gel and then transferred in the presence of 0.4 N sodium hydroxide on a charged nylon membrane. Hybridization is carried out with a specific probe corresponding to the PCR fragments amplified either with the pair G1F-G1R or the pair E1F-E1R. The probe is labeled by incorporating dUTP-digoxigenin according to the supplier's protocol (Boehringer Mannheim). The hybridization is carried out in a hybridization buffer (5XSSC, 50% formamide, 0.1% lauroylsarcosine, 0.02% SDS, 2% blocking reagent Boehringer) overnight at 42°C. The Southern is washed for twice 5 min at room temperature in a 2XSSC solution containing 0.1% SDS. Next, a high stringency wash is carried out twice for 15 min at 55°C in a 0.1XSSC solution containing 0.1% SDS. The hybridization is visualized according to the supplier's protocol (Boehringer Mannheim), in the presence of a chemiluminescent substrate for alkaline phosphatase, of the CSPD or CDP-STAR type. The filter is visualized after a 15 min exposure at 60°C.

SSCP (*single strand conformation polymorphism*) analysis makes it possible to detect discrete modifications of the sequence of the fragments amplified by PCR. The PCR is carried out in the presence of dCTP labeled with ³²P. The sample to be analyzed is denatured at 95°C for 10 min in the presence of loading buffer, and then immediately loaded onto a 10% polyacrylamide gel containing 7.5% glycerol. The migration is carried out at 4°C at 8-10 W. The gel is dried and then autoradiographed.

The PCR fragments likely to exhibit an alteration of their nucleotide sequence are sequenced according to Example 1.

Hybridization with the aid of a specific oligonucleotide (17 mers to 20 mers) corresponding to the modified nucleotide region makes it possible to identify the samples having an identical modification

(ASO method). Briefly, the southern is hybridized with an oligonucleotide which is distally labeled either with ^{32}P , or in the presence of digoxigenin (according to the Boehringer Mannheim protocol) and then washed under stringent conditions at 65°C in a 6XSSC solution containing 0.05% sodium pyrophosphate.

For example, an automated nucleotide sequencing was carried out on six PCR fragments obtained from 5 patients suffering from MS and a control reputed to be normal, and which were amplified using the primers F645: CTTCAAACAACAACCAGGAGG (SEQ ID NO: 121) (situated 26 nucleotides upstream of the initiation methionine of enverin) and PS5D: TTGGGGAGGTGGCCGACGA (SEQ ID NO: 122) (situated 6 nucleotides downstream of the non-sense codon of enverin). Modifications of the sequence of enverin were observed on the DNA from some patients (Figure 17).

EXAMPLE 3: Detection of a protein according to the invention in a biological sample

20 - Preparation of a purified protein fraction of cerebrospinal fluid from patients suffering from MS

After a treatment at 56°C for 30 min and removal of the immunoglobulins on a G HiTrap protein column (Pharmacia), the equivalent of 10 ml of CSF is deposited on a DEAE Sepharose CL-6B column (Pharmacia). The elution is carried out in 20 mM Tris-HCl, pH 8.8, and a gradient from 0 to 0.4 M NaCl, and then the fraction is dialyzed twice against a phosphate-NaCl buffer (PBS). After concentration on Ultrafree-MC (Millipore), the fraction is deposited on a Superose 12 column (FPLC Pharmacia) and eluted in the presence of PBS. After separation by polyacrylamide-SDS gel electrophoresis and electrotransfer onto an Immobilon-P membrane (Millipore), the protein bands are subjected to controlled trypsin hydrolysis.

- Analysis of the protein fraction by mass spectrometry

The peptides digested in the presence of trypsin are analyzed by the MALDI-TOF method, which

allows the analysis of peptides present in a mixture (COTTRELL J.S., Pept. Res., 1997, 7, 115-124). The peptides characterized according to their mass are compared with the proteins and with the associated proteins according to the invention.

EXAMPLE 4: Detection of specific antibodies to the env domain of HERV-7q

The identification of a long open reading frame in the env sequence of HERV-7q made it possible to determine a deduced protein sequence SEQ ID NO: 22 and 35 and Figures 18-20 of a region of the said gene.

The protein sequences deduced from the sequences ID NO: 22, 35 and Figures 18-20 are positioned as follows with respect to Figure 1 or the sequence ID NO: 3:

SEQ ID NO: 22 (reading frame 1) and Figure 19: beginning of the coding sequence: position 7874, end of the coding sequence 1st nonsense codon (position 9493)

SEQ ID NO: 35: beginning of the coding sequence: position 7874, end of the coding sequence 1st nonsense codon (position 9493) (reading frame 1)

Figure 19: beginning of the coding sequence: position 6970, end of the coding sequence 1st nonsense codon (position 9493) (reading frame 1)

Figure 20: beginning of the coding sequence: position 6971, the end of the reading frame is shifted depending on the case by 1, 2 or 3 codons

Figure 21: beginning of the coding sequence: position 6972, the end of the reading frame is shifted depending on the case by 1, 2 or 3 codons

Various peptides corresponding to all or part of SEQ ID NO: 22 (see SEQ ID NO: 23-27 and 35) were synthesized by genetic engineering in order to test their antigenic specificity toward sera or tissues from patients suffering from MS, for example. Briefly, all or part of the env region of HERV-7q is subcloned into the vectors pQE30, 31 and 32. The vectors pQE30, 31 and 32 contain, in 5' of the multiple cloning site, the consensus sequences for transcription (the strong T5

bacteriophage promoter, 2 operators of the lactose operon) and translation (one synthetic ribosome binding site). Likewise, pQE30, 31 and 32 possess, in 3', the phage 1 transcription terminator as well as a Stop
5 codon for translation. The expression of the protein is carried out after transformation in *E. coli* M15. The plasmid pQE30, 31 and 32 possess, upstream of the multiple cloning site, the coding sequence for a succession of 6 histidines having affinity for nickel
10 ions. This stretch allows the purification of the expressed chimeric protein by adsorption on a resin consisting of a chelating ligand, nitrotriacetic acid (NTA), charged with 4 nickel ions (NI-NTA resin, Qiagen).

15 The transformation is carried out by electroporation or treatment with calcium chloride. For example, an *E. coli* M15 colony is incubated in 100 ml of LB medium containing 250 µg of kanamycin, with stirring at 37°C until an OD⁶⁰⁰ of 0.5 is obtained.

20 After centrifugation for 5 minutes at 2000 g at 4°C, the bacterial pellet is taken up in 30 ml of TFB1 solution (100 mM rubidium chloride, 50 mM manganese chloride, 30 mM potassium acetate, 10 mM CaCl₂, 15% glycerol, pH 5.8), at 4°C for 90 minutes. After a
25 centrifugation of 5 minutes at 2000 g at 4°C, the bacterial pellet is taken up in 4 ml of TFB2 solution (10 mM rubidium chloride, 10 mM MOPS, 75 mM CaCl₂, 15% glycerol, pH 8). The cells may be kept at -70°C in aliquots of 500 µl. 20 µl of the ligation and 125 µl of
30 competent cells are mixed and placed on ice for 20 minutes. After a heat shock of 42°C for 90 seconds, the cells are stirred for 90 minutes at 37°C in 500 ml of Psi-broth medium (LB medium supplemented with 4 mM MgSO₄, 10 mM potassium chloride). The transformed cells
35 are plated on LB-agar dishes supplemented with 25 µg/ml of kanamycin and 100 µg/ml of ampicillin, and the dishes are incubated overnight at 37°C.

The potentially recombinant clones are subcultured in an orderly manner on a nylon filter

deposited on an LB-agar dish supplemented with 25 µg/ml of kanamycin and 100 µg/ml of ampicillin. After one night at 37°C, the recombinant clones are located by hybridization of the plasmid DNA with the nucleotide
5 probe amplified by PCR with the pair of primers according to SEQ ID NO: 45 and SEQ ID NO: 46.

An independent colony containing the insert is inoculated at 20 ml of LB medium supplemented with 25 µg/ml of kanamycin and 100 µg/ml of ampicillin.
10 After one night at 37°C, with stirring, 500 ml of the same medium are incubated at 1/50 with this preculture until an OD⁶⁰⁰ of 0.8 is obtained, and then 1 to 2 mM final of IPTG is added. After 5 hours, the cells are centrifuged for 20 minutes at 4 000 g.

15 A portion of the cellular pellet is taken up in 5 ml of sonification buffer (50 mM of sodium phosphate, pH 7.8, 300 mM NaCl) and then placed on ice. After rapid sonification, the cells are centrifuged for 20 minutes at 10 000 g. A portion of the cellular
20 pellet is taken up in 10 ml of a 30 mM Tris/HCl-20% sucrose solution pH 8. The cells are incubated for 5 to 10 minutes, with stirring, after addition of 1 mM EDTA. After a centrifugation of 10 minutes at 8 000 g at 4°C, the pellet is taken up in 10 ml of 5 mM ice cold MgSO₄.
25 After 10 minutes on the ice, with stirring, the cells are centrifuged for 10 minutes at 8 000 g at 4°C.

The pellet is taken up in 5 ml/g in buffer A (6 M GuHCl (guanidine hydrochloride), 0.1 M sodium phosphate, 0.01 M Tris/HCl, pH 8), 1 hour at room
30 temperature. The lysate is centrifuged for 15 minutes at 10 000 g at 4°C, and the supernatant is supplemented with 8 ml of Ni-NTA resin, pre-equilibrated in buffer A. After 45 minutes at room temperature, the resin is poured into a column, washed with 10 times the
35 column volume with buffer A and then with 5 times the column volume with buffer B (8 M urea, 0.1 M sodium phosphate, 0.01 M Tris/HCl, pH 8). The column is washed with buffer C (8 M urea, 0.1 M sodium phosphate, 0.01 M Tris/HCl, pH 6.3) until A280 is less than 0.01. The

recombinant protein is eluted with 10 to 20 ml of buffer D (8 M urea, 0.1 M sodium phosphate, 0.01 M Tris/HCl, pH 5.9) and then with 10 to 20 ml of buffer B (8 M urea, 0.1 M sodium phosphate, 0.01 M Tris/HCl, pH 4.5), and then with 20 ml of buffer F (6 M HCl, 0.2 M acetic acid). After SDS-PAGE analysis, the purified fraction(s) containing the chimeric protein allowed the production of antibodies in rabbits. The antibodies obtained are tested by Western blotting after visualization with a secondary antibody coupled to alkaline phosphatase.

Antibodies are obtained in the same manner, using peptides synthesized chemically according to the Merrifield technique (G. Barany and B. Merrifield, 1980, in *The peptides*, 2, 1-284, E. Gross and J. Meienhofer, Academic Press, New York).

The specific antibodies obtained are used for detection of the serum or tissue expression of all or part of the endogenous retroviral sequences according to the invention, in normal and pathological cases.

The proteins of serum or tissue origin are separated on acrylamide-SDS gel and then transferred onto a nitrocellulose filter with the aid of a Novablot 2117-2250 apparatus (LKB). The transfer is carried out on a Hybond C-extra sheet (Amersham) using a 100 mM CAPS buffer pH 11, methanol, water (V/V/V: 1/1/8) containing 1 mM CaCl_2 . After a transfer of 1 hour at 0.8 mA/cm², the sheet is saturated for 1 hour at room temperature in PBS-0.5% gelatin. The sheet is brought into contact with the specific antibody at the concentration of 1/1 000 in PBS-0.25% gelatin. After 2 hours, the filter is washed 3 times 15 minutes in PBS-0.1% Tween-20, and then the filter is incubated for 30 minutes in the presence of a secondary antibody coupled to alkaline phosphatase (Promega), diluted 1/7 500 in PBS-0.25% gelatin. After three washes in PBS-0.1% Tween-20, the filter is equilibrated in a buffer (100 mM Tris-HCl, pH 9.5, 100 mM NaCl, 5 mM MgCl_2). The visualization is carried out in the presence

of 45 μ l of NBT at 75 mg/ml and 35 μ l of BCIP at 50 mg/ml, per 10 ml of alkaline phosphatase buffer.

The chimeric proteins obtained by genetic engineering are also used for tests of biological activity, such as for example the test for biological activity of the CKS-17-type peptide identified in the env domain of HERV-7q (Figure 5).

EXAMPLE 5: Production of ribonucleic probes encoding the env sequences of HERV-7q

10 The PCR fragments obtained are subcloned into the plasmid PGEM 4Z (Promega) which possesses on either side of its multiple cloning site, promoter sequences for the SP6 and T7 RNA polymerases.

The method of competence used is electro-
15 poration. The plasmid and the PCR fragment are hybridized in a ratio of 50 ng of vector (SmaI cleavage) to 100 ng of PCR fragment (made blunt ended by treatment with the Klenow fragment of DNA polymerase). The incubation takes place overnight at
20 22°C in ligation buffer (66 mM Tris-HCl, pH 7.5, 5 mM MgCl₂, 1 mM dithioerythritol, 1 mM ATP) in the presence of 1 u of T4 DNA ligase and is then stopped by denaturation for 10 minutes at 65°C. In parallel, the
25 *E. coli* JM 105 strain is inoculated overnight at 37°C in LB medium. This preculture is diluted 1/500 and placed at 37°C until an OD⁶⁰⁰ equal to 1 is obtained. For the remainder of the procedure, the cells will always be stored at cold temperature. After centrifugation for 5 minutes at 3 500 g at 4°C, the
30 cellular pellet is resuspended in 1/4 vol. of ultra-pure ice-cold water. This step is repeated 5 to 6 times. The pellet is then resuspended in 1/4 000 vol. of water; 10% of sterile glycerol is added, allowing preservation of the electrocompetent cells, in aliquots
35 of 10 μ l at 20°C. 1 μ l of the ligation is added to 50 μ l of electrocompetent cells; the mixture is subjected to an electrical discharge of 12.5 kV/cm, applied for 5.8 ms. The cells are rapidly resuspended in the SOC medium, incubated for 1 hour at 37°C and

then plated in the presence of 2% X-Gal in dimethylformamide, and 10 mM IPTG, on an LB-agar dish supplemented with ampicillin (100 µg/ml). After one night at 37°C, the potentially recombinant white clones
5 are subcultured in an orderly manner on an LB/ampicillin dish and in parallel on a nylon filter deposited on an LB/ampicillin dish. These two dishes are incubated overnight at 37°C. The recombinant clones are then located by hybridization with a nucleic probe
10 amplified by PCR with the pair of primers according to SEQ ID NO: 45 and SEQ ID NO: 46 and labeled with digoxigenin.

The recombinant clones are cultured in 50 ml of LB/ampicillin medium (100 µg/ml), with stirring, over-
15 night at 37°C. After centrifugation at 3 500 g for 15 minutes at 4°C, the bacterial pellet is taken up in 4 ml of P1 buffer (50 mM Tris-HCl, 10 mM EDTA, 400 µg/ml RNase A, pH 8) and 4 ml of P2 buffer (200 mM NaOH, 1% SDS). The medium is incubated at room
20 temperature for 5 minutes. After addition of 4 ml of P3 buffer (2.55 M potassium acetate, pH 4.8), the mixture is centrifuged at 12 000 g for 30 minutes at 4°C. This supernatant is applied to a Qiagen type 100 column, pre-equilibrated with 2 ml of QBT buffer
25 (750 mM NaCl, 50 mM MOPS, 15% ethanol, pH 7), the column is washed with twice 4 ml of QC buffer (1 M NaCl, 50 mM MOPS, 15% ethanol, pH 7) and the DNA is eluted with 2 ml of QF buffer (1.2 M NaCl, 50 mM MPOS, 15% ethanol, pH 8). The DNA is precipitated with
30 0.8 vol. of isopropanol and centrifuged at 12 000 g at 4°C for 30 minutes. The pellet is washed with 70% ice-cold ethanol and then the plasmid DNA is taken up in twice 150 µl of TE buffer.

The ribonucleic probes are used as specific
35 probes, in particular for the detection of the transcripts expressed by the endogenous retroviral sequences according to the invention.

EXAMPLE 6: Construction of a transgenic mouse containing all or part of the gene for enverin

A transgenic mouse containing all or part of the HERV-7q sequence (SEQ ID NO: 3) is constructed so as to identify the sequences responsible for the tissue specificity, and to evaluate the role of all or part of the endogenous retroviral motifs of the HERV-7q type, in particular all or part of the peptide motifs of enverin. The microinjection technique used refers to the conventional technique (Hogan et al., (1994), Manipulating the mouse embryo, Cold Spring Harbor, Cold Spring Harbor Laboratory Press) or to its equivalents. Forms identical to the normal human molecule of motifs of the HERV-7q type, including enverin, or forms which are mutated, deleted, having insertions, or truncated are tested in order to determine the motifs which are critical both from the normal and pathological point of view, and more particularly during fetal development and during tumor processes.

20 Bibliographic references:

- Benit L. et al., 1997. Cloning of a new murine endogenous retrovirus MuERV-L, with strong similarity of the human HERV-L element and with a gag coding sequence closely related to the Fv1 restriction gene. J. Virol. 71, 5652-5657.
- Coffin J.M. 1985. Endogenous retrovirus, In: "RNA tumor viruses" (Weiss R.A., Varmus H.E., Teich N.M., and Coffin J.M. eds), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
- Conrad B., Weissmahr R.N., Boni J., Arcari R., Schupbach J., and Mach B. 1997. A human endogenous retroviral superantigen as candidate autoimmunogene in type 1 diabetes. Cell 90, 303-313.
- Covey S.N. 1986. Amino acid sequence homology in gag region of reverse transcribing elements and the coat protein gene of cauliflower mosaic virus, Nucleic Acids Res. 14, 623-633.
- Hertig C., Coupar B.E., Gould A.R., and Boyle D.B. 1997. Field and vaccine strains of fowlpox virus carry

- integrated sequences from the avian retrovirus, reticuloendotheliosis virus. *Virology* 235, 367-376.
- Hohenadl C., Leib-Mösch C., Hehleemann R., and Erfle Y. 1996. Biological significance of human endogenous retroviral sequences. *J. Acqui. Imm. Def. Synd. Hum. Retrovir.* 13, S268-S273.
- 5 - Kulkoski J.K., Jones S., Katz R.A., Mack J.P.G., and Skalka A.M. 1992. Residues critical for retroviral integrative recombination in a region that is highly conserved among retroviral/retrotransposon integrases and bacterial insertion sequence transposases. *Mol. Cell. Biol.* 12, 2331-2338.
- La Mantia G. et al., *N.A.R.*, 1991, 19, 7, 1513-1520
- Patience C., Wilkinson D.A., and Weiss R.A. 1997. Our retroviral heritage. *Trends Genet.* 13, 116-120.
- 15 - Pearson W.R. 1994. Using the FASTA program to search protein and DNA sequence databases. *Methods Mol. Biol.* 24, 307-331.
- Perron H., Garson J.A., Bedin F., Beseme F., Paranhos-Baccala G., Komurian-Pradel F., Mallet F., Tuke P.W., Voisset C., Blond J.L., Lalande B., Seigneurin J.M., Mandrand B. and the Collaborative Research Group on Multiple Sclerosis. 1997. Molecular identification of a novel retrovirus repeatedly isolated from patients with multiple sclerosis. *Proc. Natl. Acad. Sci. USA* 94, 7583-7588.
- 20 - Tönjes R.R. et al., *J. AIDS and Hum. Retrovirol.* 1996, 13, S261-S267.
- Vitelli R., Chiarillo M., Lattero D., Bruni C.B., and Bucci C., 1996. Molecular cloning and expression analysis of the human Rab7 GTP-ase complementary deoxyribonucleic acid. *Biochem. Biophys. Res. Commun.* 229, 887-890.
- 30 - Weber L.T., Miller M., Jaskolski M., Leis J., Skalka M., and Wlodawer A., 1989. Molecular modeling of the HIV-1 protease and its substrate binding site. *Science* 243, 928-931.
- 35 - Wilkinson D., Mager D.L., and Leong J.A.C. 1994. Endogenous human retroviruses. In: "The Retroviridae"

09719554.011804

(Levy J.A. ed). Plenum Press New York., Vol. 3, 465-535.

- Xiong Y., and Eickbush, T. 1990. Origin and evolution of retroelements based upon their reverse transcriptase sequences. EMBO J. 9, 3353-3362.

5 As is evident from the above, the invention is not at all limited to its embodiments, implementations and applications which have just been described more explicitly; it embraces on the contrary all the
10 variants which may occur to a specialist in this field, without departing from the framework or scope of the present invention.

0971654-011871

CLAIMS

1. A purified nucleic acid fragment, characterized
5 in that it comprises all or part of a sequence encoding
a human endogenous retroviral sequence, which has at
least *env*-type retroviral motifs, corresponding to the
sequence SEQ ID NO: 1 or to a sequence exhibiting a
10 greater than or equal to 80% on more than 190
nucleotides or greater than or equal to 70% on more
than 600 nucleotides for the *env*-type domains.
2. The nucleic acid fragment as claimed in
claim 1, characterized in that it has retroviral motifs
15 corresponding to an *env* domain and corresponding to the
sequence SEQ ID NO: 1 and retroviral motifs
corresponding to a *gag* domain and corresponding to the
sequence SEQ ID NO: 2 or to a sequence exhibiting a
level of homology greater than or equal to 80% on more
20 than 190 nucleotides or greater than or equal to 70% on
more than 600 nucleotides for the *env*-type domains and
a level of homology greater than or equal to 90% on
more than 700 nucleotides or greater than or equal to
70% on more than 1 200 nucleotides for the *gag*-type
25 domains, the said motifs having no insertion or
deletion of more than 200 nucleotides.
3. A nucleic acid fragment, characterized in that
it comprises a segment of a sequence as claimed in
claim 1 or claim 2 and in particular the sequence
30 SEQ ID NO: 3-22, 28 and 61, the complementary nucleic
sequences and the reverse sequences complementary to
the preceding sequences as well as fragments derived
from the coding regions of the preceding sequences
corresponding to a shifting frame greater than or equal
35 to 14 nucleotides or their complementary sequences.
4. Transcripts, characterized in that they are
generated from the sequences as claimed in any one of
claims 1 to 3.

103710-15567-60

5. A diagnostic reagent for the differential detection of complete or partial human endogenous nucleic sequences, having retroviral motifs, selected from the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2, characterized in that it is selected from the group consisting of the sequences SEQ ID NO: 1-22, 28, 37-57, 59-61 and 121-122, the complementary nucleic sequences and the reverse sequences complementary to the preceding sequences, of nucleotide fragments capable of defining or of identifying the sequences SEQ ID NO: 1 and/or SEQ ID NO: 2 and any flanking sequence or any sequence overlapping them as well as of fragments derived from the coding regions of the sequences SEQ ID NO: 1-22 and 61, corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences, optionally labeled with an appropriate label.

6. The reagent as claimed in claim 5, characterized in that it is chosen from the regions situated between nucleotides 3065 and 4390, nucleotides 6965 and 9550 or nucleotides 2502-2865 of SEQ ID NO: 3.

7. The reagent as claimed in claim 5, characterized in that it is selected from the sequences SEQ ID NO: 37-57, 59-60 and 121-122 and in that it is capable of being used as a primer.

8. The reagent as claimed in claim 5, characterized in that it is selected from the following sequences:

- a fragment of 1505 nt amplified by the pair of primers SEQ ID NO: 37 and SEQ ID NO: 38 (primers G1F and G1R),

- a fragment of 2529 nt amplified by the pair of primers SEQ ID NO: 45 and SEQ ID NO: 46 (primers E1F and E1R),

- a fragment of 182 nucleotides, repeated twice, situated upstream of the *gag* domain at positions 2502-2611/2613-2865,

and in that it is capable of being used as a probe.

9. The reagent as claimed in claim 5, characterized in that it is chosen from the group consisting of the fragments encoding or not encoding all or part of enverin, in particular the fragments comprising at least 14 nucleotides and more particularly the fragments encoding the C-terminal portion of enverin, either from the amino acid 291, or from the amino acid 321, starting from the codon encoding the first methionine.

10. A method for the rapid and differential detection of the endogenous retroviral nucleic sequences of the *env* or *env* and *gag* type, their normal or pathological variants, by hybridization and/or gene amplification, carried out using a biological sample, which method is characterized in that it comprises:

(a) a step in which a biological sample to be analyzed is brought into contact with at least one probe as claimed in claim 5, claim 6 or claim 8, and

- (b) a step in which the product(s) resulting from the nucleotide sequence-probe interaction is detected by any appropriate means.

11. The method of detection as claimed in claim 10, characterized in that it comprises:

* prior to step (a):

- . a step of preparing the relevant biological tissue or fluid,
. a step of extracting the nucleic acid to be detected, and
. at least one gene amplification cycle carried out with the aid of at least one reagent as claimed in any one of claims 5 to 7, and

* subsequent to step (b):

- . a step of comparing the nucleic sequences obtained in the said biological sample with the human endogenous retroviral sequences as claimed in any one of claims 1 to 3, by any appropriate means and in particular by sequencing, Southern blotting, restriction cleavage, SSCP or any other method which makes it possible to identify an insertion or a

deletion or a single mutation between the various sequences compared.

12. A method of detecting the transcripts as claimed in claim 4, characterized in that it comprises:

5 - collecting messenger RNAs obtained from control biological samples and from a similar sample collected from patients, and

- the qualitative and/or quantitative analysis of the said mRNAs by *in situ* hybridization, by dot-blot, Northern blotting, RNase mapping or RT-PCR, with
10 the aid of a diagnostic reagent as claimed in any one of claims 5 to 9.

13. Chimeric sequences, characterized in that they consist of a fragment of 17 to 40 nucleotides of a flanking sequence selected from the group consisting of
15 transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/deregulation of motifs belonging to said
20 HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of the said HERV-7q family and in
25 which one of the ends cannot be at a distance exceeding 120 kb, associated with an endogenous retroviral motif of the HERV-7q type comprising between 17 and 40 nucleotides as claimed in claims 1 to 4.

14. A method for the detection and/or evaluation of
30 an overexpression/underexpression or of a modification of at least one of the endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or of their associated flanking sequences, as claimed in any one of claims 1 to 9, characterized in that it
35 comprises:

- depositing on an appropriate support, cDNA obtained from clones, PCR products obtained from genomic DNA, RT-PCR products obtained from transcripts or from specific oligonucleotide sequences, the said

- DNA sequences being endogenous retroviral sequences or fragments of sequences of the HERV-7q type and/or their flanking sequences, consisting of transcripts and cDNAs of the genomic sequences, which encode all or part of a
- 5 factor, whose function, regulation/deregulation or alteration is associated with the normal or pathological expression or with the regulation/deregulation of motifs belonging to the said HERV-7q family, these sequences corresponding to nucleotide
- 10 sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of the said HERV-7q family and in which one of the ends cannot be at a distance exceeding 120 kb, and/or a chimeric sequence as claimed in claim 13,
- 15 - the hybridization of the said support with at least one appropriately labeled probe obtained, for example, by retrotransposition of an RNA mixture obtained from biological cells, tissues or fluids obtained from controls reputed to be normal, from
- 20 members of various ethnic populations, from patients suffering from pathological conditions often associated with expression of retroviruses, such as tumor processes, or such as autoimmune diseases, and
- the detection of the hybrids formed.
- 25 15. The method as claimed in claim 14, characterized in that the said transcript or cDNA is selected from the group consisting of the sequences SEQ ID NO: 62-67 and 119 and their fragments corresponding to a shifting frame greater than or equal to 14
- 30 nucleotides or their complementary sequences.
16. The method as claimed in claim 14 or claim 15, characterized in that the said support comprises, in addition, any endogenous or exogenous retroviral sequence.
- 35 17. The kit for the detection and/or evaluation of an autoimmune disease and in particular of neuropathological conditions with an autoimmune etiology, characterized in that it comprises, in

addition to the buffers necessary for carrying out a method according to any one of claims 14 to 16:

- diagnostic reagents A as claimed in any one of claims 5 to 9, and

- 5 - reagents B consisting of the transcripts and cDNAs of the genomic sequences, which encode all or part of a factor, whose function, regulation/de-regulation or alteration is associated with the normal or pathological expression or with the regulation/de-regulation of motifs belonging to said HERV-7q family, these sequences corresponding to nucleotide sequences encoding genes situated in flanking regions situated upstream and/or downstream of a retroviral sequence of said HERV-7q family, of which one of the ends cannot be
- 10 at a distance exceeding 120 kb,
- 15 - which reagents are preferably attached to an appropriate support.

18. The kit as claimed in claim 17, characterized in that said reagents B are selected from the group
- 20 consisting of the sequences SEQ ID NO: 62-67 and 119 and their fragments corresponding to a shifting frame greater than or equal to 14 nucleotides or their complementary sequences.

19. Translational products, characterized in that they are encoded by a nucleotide sequence as claimed in any one of claims 1 to 4.
- 25 20. A peptide, characterized in that it is capable of being expressed with the aid of a nucleotide sequence selected from the group consisting of the sequences

- 30 SEQ ID NO: 1-22, 28 and 61 as claimed in any one of claims 1 to 4.
21. The peptide as claimed in claim 20, characterized in that it includes the derived peptides comprising between 5 and 540 amino acids and in particular a
- 35 fragment of 538 amino acids, starting at the first methionine of the sequence SEQ ID NO: 26 (enverin).

22. The peptide as claimed in claim 20 or claim 21, characterized in that it is selected from the group consisting of:

- . the sequences SEQ ID NO: 23-36;
- . the sequence SEQ ID NO: 58;
- . a C-terminal fragment of the sequence
SEQ ID NO: 26, either from the amino acid 291, or from
5 the amino acid 321, starting from the first methionine
of the sequence SEQ ID NO: 26;
- . a peptide of the CKS-17/CKS-25 type present
in one of the sequences SEQ ID NO: 23-36 or 58; and
- . the peptides having affinity with one of the
10 haplotypes of the class I or class II HLA system and in
particular the fragments 399-471, 244-271 of enverin,
as well as the peptides having the sequence
SEQ ID NO: 68-118, in accordance with Table I.
- 23. The peptide as claimed in any one of claims 20 to
15 22, characterized in that it is obtained from nucleic
sequences as claimed in any one of claims 1 to 4, in
which at least one non-sense codon may be replaced with
a codon encoding one of the following amino acids: Phe
(F), Leu (L), Ser (S), Tyr (Y), Cys (C), Trp (W), Gln
20 (Q), Arg (R), Lys (K), Glu (E) or Gly (G).
- 24. Immunogenic or vaccine compositions for protecting
against autoimmune diseases, in particular in at motif
selected risk subjects, characterized in that it
comprises at least one peptide comprising at least one
25 motif of the CKS type and/or at least one motif
selected from the group consisting of the peptides
having affinity with one of the haplotypes of the class
I or class II HLA system and at least one
pharmaceutically acceptable vehicle.
- 30 25. The composition as claimed in claim 24,
characterized in that said peptide having affinity with
one of the haplotypes of the class I or class II HLA
system is selected from the group consisting of the
peptides as defined in Table I.
- 35 26. The composition as claimed in claim 24 or claim
25, characterized in that said peptide has the sequence
SEQ ID NO: 120.

0971554-01001
100110-4556760

27. An antibody, characterized in that it is directed against one or more of the peptides as claimed in any one of claims 20 to 23.

28. A pharmaceutical composition, characterized in that it comprises neutralizing antibodies produced from the peptides of Table I (SEQ ID NO: 68-118) and their homologues.

29. A method for the differential immunological screening of normal or pathological human endogenous retroviral sequences of the HERV-7q family, characterized in that it comprises bringing a biological sample into contact with an antibody as claimed in claim 27, the reading of the result being visualized by an appropriate means, in particular EIA, ELISA, RIA, fluorescence.

30. A method for the identification and detection of endogenous retroviral motifs which are abnormally expressed in the context of pathological conditions associated with cancer, or of neuropathological conditions, in particular autoimmune neuropathological conditions, at the forefront of which is multiple sclerosis, characterized in that it comprises the comparative analysis of the sequences extracted from a biological sample and the sequences as claimed in any one of claims 19 to 23.

31. An application of the sequences as claimed in any one of claims 1 to 9, 13, 14 or 19 to 23 to the diagnosis of, to the prognosis of, to the evaluation of genetic susceptibility to, any induced, congenital or acquired human diseases, in particular those with cancerous, autoimmune and/or neurological components, such as multiple sclerosis, the associated syndromes and the neurodegenerative diseases in which all or part of the sequences as claimed in to any one of claims 1 to 5 and related endogenous or exogenous forms are involved.

32. Hybrid nucleic sequences, characterized in that they comprise sequences or motifs as claimed in any one of claims 1 to 9, combined with sequences or motifs of

endogenous origin or of exogenous origin or induced exogenously.

33. A recombinant cloning or expression vector, characterized in that it comprises a nucleic sequence
5 as claimed in any one of claims 1 to 4.

34. An immunogenic or vaccine composition, characterized in that it comprises a vector including at least one nucleic sequence encoding a peptide as defined in Table I, optionally combined with a sequence
10 encoding a motif of the CKS-17 type.

35. A gene therapy vector, characterized in that it comprises all or part of the endogenous retroviral nucleic sequences of the HERV-7q type as claimed in any one of claims 1 to 4.

15 36. The vector as claimed in claim 35, characterized in that said sequences are selected from the group consisting of the sequences SEQ ID NO: 2, 20 and 21.

37. Transgenic animals, characterized in that they comprise all or part of a sequence of the HERV-7q type
20 (SEQ ID NO: 1-22, 28 and 61).

10010454400

- 69 -

Abstract

The invention concerns a novel nucleic sequence and deduced protein sequence family with whole or partial human endogenous retroviral motifs. The invention also concerns the detection and/or the use of said nucleic sequences and said corresponding protein sequences or fragments of said sequences, for diagnostic, prophylactic and therapeutic uses, in particular for neuropathological conditions with autoimmune constituent such as multiple sclerosis. Said purified nucleic acid sequences comprise all or part of a sequence coding for a human endogenous retroviral sequence having at least env-type retroviral motifs, corresponding to the sequence SEQ ID NO:1 or to a sequence having a homology level with said sequence SEQ ID NO:1 not less than 80% of more than 190 nucleotides or not less than 70% on more than 600 nucleotides for env-type domains. The invention further concerns the use of the flanking or adjacent sequence of said sequences and controlled by the latter, as diagnostic reagents.

0974554-01131

repeat
region
R'

tandem
repeat
regions

১৩৩

30:
domain

FIGURE 1.1

3/64

FIGURE 2

09/19554-01401

FIGURE 3

CONCLUSIONS

5/64

IPMALPYHIFLFTVLLPSFTLTAPPPCRMTSSSPYQEFWLRMQRPGNIDAPSYRSLSKG
 TPTFTTAHTMPRNCYHSATLCMHANTHYWTGMINPSCPGGLGVTVWCWYFTQTGMSDGG
 GVQDQAREKHVKEVISQLTRVHGTSSPYKGLDLSKLHETIRTHTRLVSLFNTTLTGLHEV
 SAQNPTNCWICLPLNFRFPYVSI PVPEQWNNFSTEINTTSVLVGPLVSNLEITHTSNLTVCV
 KFSNTTYTNSQCIRWVTPTPTQIVCLPSGIFVCGTSAYRCLNGSSESMECFLSFLVPPMT
 IYTEQDLYSYVISKPRNKRPVILPFVIGAGVLGALGTGIGGITTSTQFYFKLSQELNGDM
 ERVADSLVTLODQLNSLAAVVLQNRRLDLLTAERGGTCLFLGEECCYYVNSQSGIVTEKVKIEIRDRIQRRAEELR
 NTGCPWLLSQMFWILPFLGPIAAIILLLFGPCIFNLLVNFVSSRIEAVKLQMEPKMQSKTKIYRPLDRPAS
 RSDVNDIKGTPPEETSAQPLLRPNSAGSS

FIGURE 4

- 1) NSLAAVVLQNRRLDLLTAESGGTFLFLEEC
- 2) NSLAAVVLQNRRLDLLTAERGGTCLFLGEEC
- 3) DSLAAVTLQNHQGLDLLTAEGGLCYFLGEDC
- 4) DSLAAVTLQNHQGLDLLTAEGGLCTFLGEEC
- 5) DSLAAVTLQNCRGLDLLTAEGGGHYTFLGEEC
- 6) LQNRRLDLLFLKEGGCLC
- 7) DSLAKVVLQNRRLDLLTAEQGGICLALQEQK

FIGURE 5

TSFVEKANGVKCHKYKLSFXHETTHNYKSVIYALQEAFRVYLPILPASPTPSPTNKDPPSTQMVQKEIDKRVNSEPKS
 ANIPQLXPLQAVGGREFGPARVHVPPSLPDLKQIKTDLGKFSNDPDGYIDVLQGLGQFFDLTWDRDMSLLNQTLTPNER
 SATITAAEXEFGDLWYLSQVNDRMTEEREXFPTGQAVPSLDPHWDTESEHGDWCRRHLLTCVLEGLRKRKKSMMYNSM
 MSTITQGREENPTAFLERLREALRKRAASLSPDSSEGLILKRFKITQSAADIRKKLQKSAVGPEQNLETLLNLATSVFY
 NRQDEEQAEQDKRDXKKGHRFSHDQPASGLWRLWKREKLKLNAXXGLLVPVRSRTLKRLSKKXKAAPSSMPLISRES
 LEGPLPQGTKVLXVRSHXPD/SSRT

FIGURE 6

6/64

CCTGGCACTCCTGAGGGAAGTATAAAATTATAACCCATCTTTACAGCTAGACCTCTTTGTAGAAAAGGCA
CCTGGC-CTCCTGAGGGAAGTATAAAATTATAACCCATCTTTACAGCTAGACCTCTTTGTAGAAAAGGGAAG
-CAAAATGGAGTGAAGTGCCATAAGTACAAACTTTCTTTTCAATTAAGAGCAACTCACAATTATGTAAAAA
GCAAAATGGAGTGAAGTGCCATATGTACAAACTTTCTTTTCAATTAAGAGATACTCCCAATTATGTAAAAA
GTGTGATTTATGCCCCTACAGGAAGCCTTCAGAGTCTACCTCCCTATCCCAAGCAT--CCCGACTCTCTCC
GTGTGATTTATGCCCCTACAGGAAGCCTTCAGAGTCTACCTCCCGACCCACGAAGACCCCACTCTCTCT
CCAACTAATAAGGACCCCTCTCAACCCAAATGTGCCAAAGAGAGATAGACAAGAGGGTAAACAGCTGAAC
CCAACTAATAAGGACCCCTCTCAACCCAAATGTGCCAAAGAGAGATAGACAAGAGGGTAAACAGCTGAAC
CAAGAGTGGCAATATTCCCAATTATGACCC-CTCCAAAGCAGTGGGAGGAAGAGAAATTCGGCCACGCCA
CAAGAGTGGCAATATTACAGATTAT-ACTGCTCCAAAGCAGTGGGAGGA-GA-ATT--GGCCACGCCA
GAGTGATGTGCTCTTTCTCTCCAGCTTTAAAGCAATAAAGCAGACTTAGGTAAATTTCCAGATAA
GCTGCATGTACCTTTTCTCTCTCAGATTAAAGCAAAATAAATAGACTAGGTAAATTTCCAGATAA
CCTGATGCTATATTGATGTTTTTACAAGGGTTAGGCAAACTCTTTGATCTGACATGGAGAGATATAATG
CCTGATGGCTATATTGATGTTTTTACAAGGGTTAGGCAAACTCTTTGATCTGACATGGAGAGATATAATG
TCACTGCTAAATCAGACACTAACCCTAAATGAGAGAAGTGCCACCAATACTCGACCTGAGAGTTGGCG
TTATGCTAAATCAGACACTAACCCTAAATGAGAGAAGTGCTGCTAAACAGAGCTAGAGATTGGGG
ATCTCTGGTATCTCAGTCAGGCTCAATGATGAGATGACACAGAGGAAGAGAAATGATCCACAGGCCA
AACTCTGGTATCTCAGTCAGGCTCAATGATGAGATGACAAACAGATGAAGAGAAATGATCCACAGGCCA
GCAGGCACTTCCCACTGACACCTCATTGGGACACAGATCAGAACATGGAGATTGGTCTGACAGCAT
GCAGGCACTTCCCACTGACACCTCATTAGGACACAGATCAGAACATGGAGATTGGTCCACAGCAT
TTGCTAACTTGTGCTAGAAGGACTAAGGAAACTAGGAAGAGTCTATGAATTAATCTCAATGATGTCCA
TTGCTAACTTGTGCTAGAAGGACTAAGGAAACTAGGAAGAGGCTGAAATTAATCAATGATGTGCC
CCATACACAGGGAAGGAGAAATCTCTGCTCTTGGAGAGACTAAGGAGGATTGAGGAGCG
CTATAACACAGGGAAGGAGAAATCTCTGCTCTTGGAGAGACTAAGGAGGATTGAGGAGCA
TGCTCTCTGTGACCTGACTCTTCTGAAGGCCAACTAATCTTAAAGCGTAAGTTTATCACTAGTCAGCT
TACTCCCTGTGACCTGACTCTTATTAAGGCCAACTAATCTTAAAGGATAAGTTTATCACTAGTCAGCT
CGAGCATTAGAAAAAATCTCAAAAGCTGCGGTAGCGCCGAGCAAACTTAGAAACCTTATGAAT
CGAGGATTAGAAAAATCTCAAAAGTATGCTTAGCGCCAGAGCAAACTTAGAAACCTTACTGAACT
TGCAAACTCGGTTTTTTTATAAGATCAGGAGGAGCAGCGGGAACAGGCAAAACCGGATTAATAAAA
TGCAAACTCGGTTTTTTTATAAGATCAGGAGGAGCAGCGGGAACAGGCAAAACCGGATTAATAAAA
A-----GGCCACCGCTTTAGTCATGACCTCAGGCAAGTGGACTTTGGAGGCTCTGGAAGAGGAAAA
AAAAAAAGGTGACTGCTTTAGTCGTCGCGCTCAGGCAAAATGGACTTTGGAGGCTCAGAAAAAGGAAAA
GCTGGCAAAATGAATGCTTAATAGGGCTTGCTTCAGTGGGCTCTACAGGACACTTAAAAAGATTG
GCTGACAAATGATGCTCAGAGGCTGCTCTGATGCTGCTACAGGACACTTAAAAAGATTG
TCNAGTAGAGTAGCGCCCTCTGCTCAATGCTCTTATTCAGGGAATCACTGGAAGGCCACTGC
TCNAGTAGAGTAGCGCCCTCTGCTCAATGCTCTTATTCAGGGAATCACTGGAAGGCCACTGC
CCAGGGGACAAAGGCTCTGAGTCAGAGGCCACTAACAGATGATCCAGCAGCAGGACTGAGGTTGCC
CCAGGAGATGAAGGCTCTCTGAGTCAGAGGCCACTAACAGATGATCCAGCAGCAGGACTGAGGATTGCC
TGGGGCAAGGCCCATCCATGCCATCAACCTACAGAGCGCTGGGATGCTTGACCATGGAAGGCCAGGA
CAGGGCAAGGCCCAATGCCATCAACCTACAGAGCGCTTGGGATGCTTGACCATGGAAGGCCAGGA
GCTT---GTCTCCTGGAACACTGGTGGCTCTTATGCTTACTCTTCTGTCGCGCAACCTGCTCTCC
GCTTCACTGCTCTTGGACACTGGTATGGCTCTTCACTTACTCTCTGCTGCGACACTGCTCTCT

FIGURE 7

WO 99/67395

7/64

01/ TAAATCCCCATGGCCCTCCCTTATCATATTTTTCT
02/ TAAATCCCC-TGGCCCTCCCTTATCATATTTTTCT
03/ TAAATCCCCATGGCCCTCCCTTATCATATTTTTCT
04/ TAGATCCTCATGGCCCTCC-TTGTGCATATTTTTT

01/CTTTACTGTTCTTTTA-CCCTCTTTCACCTCTCACTGCACCCCTCCATGCCGCTGTATGACC
02/CTTTACTGTTCTCTTACCCCTCTTCACTCTCACTGCACCCCTCCATGCCACTGCACCCCTC
03/CTTTACTGTTCTCTTA-CCCTCTTCTCTCACTGCACCCCTCCATGCTGCTGTACAACTC
04/CTTTACTGTTCTCTTA-CCCTCTTTCACCTCTCACTGCACCCCTCCATGCCACTGTACTACC

01/AGT-----AGCTCCCTTACCAAGAGTTTCTATGGAGAATGCAGCGT
02/GTCCATGCCCGTCTCTATGCCAGTAGTCCCTTAGCAAGAGTTTCTATGGAGAATGCAGCGT
03/AGC-----AGCTCCCTTACCAAGAGTTTCTATGGAGAATGCCGCTT
04/AGT-----AGCTCCATTACCAAGAGTTTCTATGSAATGCAGCGT

01/CCCCGAAATATTGATGCCCATCGTATAGGAGTCTTTCTAAGGGAACCCCACTTCTCACTGC
02/CCCCGAAATATTGATGCCCATTTGATAGGAGTTTATCTAAGGGAACCCCACTTCTCACTGC
03/CCCCGAAATATTGATGCCCATCAATAGGAGTTTACCTAAGGGAACCTCCACTTCACTGC
04/CCTGGAATATTGATGACCATCGTATAGGAGTTTTTCTAAGGGAACCCCACTTCTCACTGC

01/CCACACCCATATGCCCGCAACTGCTATCACTCTGCCACTCTTTGCATGCATGCAAACTACTC
02/CCACACCCATATGCCCGCAACTGCTATCACTCTGCCACTCTTTGCATGCATGCAAACTACTC
03/CCACACCCATATGCCCGCAACTGCTATCACTCTGCCACTCTTTGCATGCATGCAAACTACTC
04/CCACACCTATATGACC-----

01/ATTATTGGACAGGAAAAATGATTAATCCTAGTTGTCTGGAGGACTTGGAGTCACTGTCTGT
02/ATTATTGGACAGGAAAAACGATTAATCCTAGTTGTCTGGAGGACTTGGAG-----
03/ATTATTGGACAGGAAAAATGATTAATCCTAGTTGTCTGGAGGACTTGGAGGCACTGTCTGT
04/-----

01/TGGACTTACTTCACCCAACTGGTATGTCTGATGGGGGTGGAGTTCAAGATCAGGCAAGAGA
02/--GACTCACTTCACTCATACCATGATGTCTGATGGGGGTGGAGTTCAAGATCAGGCAAGAGA
03/CGGACTTACTTCACCCATAGTGTCTGATGGGGGTGGAGTTCAAGATCAGGCAAGAGA
04/-----

01/AAAACATGTAAAGAAGTAATCTCCCACTACCCGGGTACATGGCACCTCTAGCCCCACATA
02/AAAACATGTAAAGAAGTAATCTCCCACTAGCTGGGTACATAGCACCCCTGGCCCCACATA
03/AAAACATGTAAAGAAGTAATCTCCCACTAGCCGGGTACATAGCACCCCTAGCCCCACATA
04/-----

01/AAGGACTAGATCTCTCAAACTACATGAAACCTCCGTAACCATCTCGCTGGTAAGCCTA
02/AAGGACTAGATCTCTCAAACTACATGAAACCTCCATACCCATCTGGCTGGTAAGCCTA
03/AAGGACTAGATCTCTCAAACTACATGAAACCTCCATACCCATCTGGCTGGTAAGCCTA
04/-----

01/TTTAATACCACTCTCACTGGGCTCCATGAGGCTCTCGGCCCAAAACCTACTAAGTGTGGAT
02/TTTAATACCACTCTCACTGGGCTCCATGAGGCTCTCGGCCCAAAACCTACTAAGTGTGGAT
03/TTTAATACCACTCTCACTGGGCTCCATGAGGCTCTCGGCCCAAAACCTACTAAGTGTGGAT
04/-----

01/ATGCCTCCCCCTGAACCTCAGGCCATATGTTTCAATCCCTGTACCTGAACATGGAACAACCT
02/GTGCCTCCCCCTGAACCTTAGGCCATATGTTTCAATCCCTGTACCTGAACATGGAACAACCT
03/GTGCCTCCCCCTGTATTTCAAGGCCATGATTTTCAATCCCTGTACCTGAACATGGAACAACCT
04/-----TGCACTTCAGGCCATATGTTTCAATCCCTGTAT-----

FIGURE 8.1

8/64

01/TCAGCACAGAAATAAACACCACTTCCGTTTTAGTAGGACCTCTTGTTTCCCAATCTGGAAATA
 02/TCAGCACAGAAATAAACACCACTTCTGTTTTAGTAGGCTCTC---TTTCCAACTCTGGAAATA
 03/ACAGCACAGAAATAAACACCACTTCCGTTTTAGTAGGACCTCTTGTTTCCCAATCTGGAAATA

01/ACCCATACCTCAAACCTCACCTGTGTAAATTTAGCAATACTACATACACAACCAACTCCCA
 02/ACCCATACCTCAAACCTCACCTGTGTAAATTTAGCAATACTATAGACACAGCCAACTCCCA
 03/ACCCATACCTCAAACCTCACCTGTGTAAATTTAGCAATACTGTAGACACAACCAACTCCCA
 04/-----

01/ATGCATCAGGTGGGTAACCTCTCCACACAATAGTCTGCCTACCCCTCAGGAATATTTTTG
 02/ATGCATCAGGTGGGTAACCTCTCCACACAATAGTCTGCCTACCCCTCAGGAATATTTTTG
 03/ATGCATCAGGTGGGTAACCTCTCCACACAATAGTCTGCCTACCCCTCAGGAATATTTTTG
 04/-----

01/TCTGTGGTACCTCAGCCTATCGTTGTTGAATGGCTCTTCAGAATCTATGTGCTTCCTCTCA
 02/TCTGTGGTACCTCAGCCTATCATTTGTTGAATGGCTCTTCAGAATCTATGTGCTTCCTCTCA
 03/TCTGTGGTACCTCAGCCTATCGTTGTTGAATGGCTCTTCAGAATCTATGTGCTTCCTCTCA
 04/-----

01/TTCTTAGTGCCCCCTATGACCATCTACACTGAACAAGATTATACAGTTATGTCATATCTAA
 02/TTCTTAGTGCCCCCTATGCCCATCTACACTGAACAAGATTATACAAATCATGTCACTCTAA
 03/TTCTTAGTGCCCCCT-ATGACCATTACACTGAACAAGATTATACAAATATGTGTACCTAA
 04/-----

01/GCCCCGCAACAAAAGAGTACCCATTCTTCTTTGTTATAGGAGCAGGAGTGCTAGGTGCRC
 02/GCCCCGCAACAAAAGAGTACCCATTCTTCTTTGTTATGAGCAGGAGTGCTAGGTGCRC
 03/GCCCCGCAACAAAAGAGTACTCATTCTTCTTTGTTATCGGAGCAGGAGTGCTAGGTGCRC
 04/-----

01/TAGGTACTGGCATTTGGCGGTATCACAACTCTACTCAGTTCTACTACAAACTATCTCAAGAA
 02/TAGGTACTGGCATTTGGCGGTATCACAACTCTACTCAGTTCTACTACAAACTATCTCAAGAA
 03/TAGGTCTGGCATTTGGCGGTATCACAACTCTACTCAGTTCTACTACAAACTATCTCAAGAA
 04/-----

01/CTAAATGGGGACATGGAACGGGTGCGGACTCCCTGGTCACCTTGCAAGATCAACTTAACCT
 02/CTAAAGGTGACATGGAATGGGTGCTGATACCTGGTCACCTTGCAAGATCAACTTAACCT
 03/CTCAATGGTGACATGGAATGGGTGCGGACTCCCTGGTCACCTTGCAAGATCAACTTAACCT
 04/-----

01/CCTAGCAGCAGTAGTCTTCAAATCGAAGAGCTTTAGACTTGCTAACCGCTGAAGAGGGG
 02/CCTAGCAGCAGTAGTCTTCAAATCGAAGAGCTTTAGACTTGCTAACCGCGGAAGCGGGG
 03/CCTAGCAGCAGTAGTCTTCAAATCGAAGAGCTTTAGACTTGCTAACCTCTGAAGAGGGG
 04/-----

01/GAACCTGTTTATTTTAGGGGAAGAATGCTGTTATTATGTT-----
 02/GAACCTTTTTATTTTAGAGGAAAAATGCTGTTATTATGTT-----
 03/GAAGCTGTTTATTTTAGGGGAAGAATGTTGTTATTATGTTATTTTAGCGGAAGAATGTTGTT
 04/-----

01/-----AATCAATCCGGAATCGTCACTGAGAAAGTTAAAGAAATTCAGAGTCGAATACA
 02/-----AATCAATCCGGAATCATCACCAGAAAGTTAAAGAAATTCAGAGTCGAATACA
 03/TATTATGTTAATCAATCCTGAATTGTCACAGAAAGTTAAAGAAATTCAGAGTTGAATACA
 04/-----

01/ACGTAGAGCAGAGGAGCTTCGAAA-CACTGGACCTGGGGCTCTCAGCCAATGGATGCCCT
 02/ACGTAGAGCAGAGGAGCTCGAAA-CACTGGACCTGGGGCTCTCAGCCAATGGATGCCCT
 03/ACGTAGAACAGAGGAGCTTCAAAAACACCAGACCTGGGGCTCTCAGCCAATGGATGCCCT
 04/-----

FIGURE 8.2

09719554-011801

9/64

01/GGATTCTCCCCTTCTTAGGACCTCTAGCAGCTATAATATTGCTACTCCTCTTTGGACCCCTGTA
02/GGATTCTCCCCTTCTTAGGACCTCTAGCAGCTATAATATTGCTACTCCTCTTTGGACCCCTGTA
03/GGATTCTCCCCTTCTTAGGATCTCTAGCAGCTCTAATATTGATACTCCTCTTTGGACCCCTGTA
04/-----

01/TCCTTAAACCTCCTTGTTAACTTTGTCTCTTCCAGAATCGAAGCTGTAAACTA-----
02/TCCTTAAACCTCCTTGTTAAAGTTTGTCTTTCCAGAATCGAAGCAGTAAACTACAAATCGTTTC
03/TCCTTAAACCTCCTTGTTAAAGTTTGTCTCTTCCAGAATCAAAGTTGTAAAGCTACAAATCGTTTC
04/TCCTTAAACCTCCTTGTTAAAGCTTGTCTCTTGCAGAATCGAAGCTGTAAACTACAAATCGTTTC

01/--CAAATGGAGCCCCAAGATGCAGTCCAAGACTAAGATCTACCGCAGACCCCTGGACCGGCCTG
02/TTCAAATGGAGCCCCCAGATGCAGTCCATGAGTAAATCTACCACGGACCCCTGGACCGGCCTG
03/TTCAAATGGAACCCAGATGAAGTCCATGACTAAGATCTACCGTGGACCCCTGGACCGGCCTA
04/TTAAATAGAGCCCCCAGATGCAGTCCATGGCTAAGATCTACCACGGACCCCTGGACCGGCCTG

01/CTAGCCCACGATCTGATGTTAATGACATCAAAGGCACCCCTCCTGAGGAAATCTCAGCTGCAC
02/CTAGCCCATGCTCTGATGTTAATGACATCAAAGGCACCCCTCCCGAGGAAATCTCAACTGCAC
03/CTAGCCCATGCTCCAATTGTAATGATATCGAAGCGACCCCTCCCGAGGAAATCTCAACTGCAC
04/CTAGCCCATGCTCTGATGTTGATGACATTGAAGGCACGGCTTCGGAGGAAATCTCAACTGCAC

01/AACCTCTACTACGCCCCAATTACAGCAGGAAGCAGTTAGAGCGGTCGTCGGCCAACCTCCCC
02/AACCTCTACTACGCCCCAATTACAGCAGGAAGCAGTTAGAGTGGTTGTTGGCCAACCTCCCC
03/AACCCCTACTATGCCCCAATTCCGCAGGAAGCAGTTAGACTGGTCGTCAGCCAACCTCCCC

04/GACCCCTACTACACCCCAATTTAGCGGGAAGCAATTAGAGCAGCCTATGCCCACCTCCCC

FIGURE 8.3

09719554-01500

10/64

CTTCCCCAACTAATAAGGACCCCCCTTCAACCCAAACAGTCCAAAAGGACATAGACAAAGGA 3
CTTCCCCAACTAATAAGGACCCCCCTTCAACCCAAACAGTCCAAAAGGACATAGACAAAGGA 4
CTTCCCCAACTAATAAGGACCCCCCTTCAACCCAAACAGTCCAAAAGGAGATAGACAAAGG 5
CTTCTCCAACATAATAAGGACCCCCCTTCAACCCAAACAGTCCAAAAGGAGATAGACAAAGG 6
CTTCCCCAACTAATAAGGACCCCCCTTCAACCCAAACAGTCCAAAAGGAGATAGACAAAGG 7

GTAAACAATAAGCAAGAGAGTGCCTAATATTCCTGTTATGCACCCCTCCAAGCGGTGGGAG-- 3
GTAAACAATAAGCAAGAGAGTGCCTAATATTCCTGTTATGCACCCCTCCAAGCGGTGGGAG-- 4
GTAAACAATAAGCAAGAGAGTGCCTAATATTCCTGTTATGCACCCCTCCAAGCGGTGGGAG-- 5
GTAAACAATAAGCAAGAGAGTGCCTAATATTCACAGGATTACTCGCTCCAAGCGGTGGGAG-- 6
GTAAACAATAAGCAAGAGTGCCTAATATTCCTGTTATGCACCCCTCCAAGCGGTGGGAG-- 7

A-AGAATTCGGCCAGCCAGAGTGCATGTACCTTTTTCTCTCTCAC-ACCTGAAGCAAATTTAA 3
A-AGAATTCGGCCAGCCAGAGTGCATGTACCTTTTTCTCTCTCAC-ACCTGAAGCAAATTTAA 4
AGAGAATTCGGCCAGCCAGAGTGCATGTGCTTTTTCTCTCCAG-ACCTTAAGCAAATTTAA 5
-GAGAATTTGGCCAGCCAGCGTGCATGTACCTTTTTCTCTCTCAC-ATTTAAAGCAAATTTAA 6
-GAGAATTCGGCCAGCCAGAGTGCATGTACCTTTTTCTCTCTAGACTTTAAA---TTAAA 7

ATAGACNTAGGTNAATTNTCAGATAGCCCTGATGGYTATATTGATGTTTACAAAGGATTAGGA 3
ATAGACNTAGGTNAATTNTCAGATAGCCCTGATGGYTATATTGATGTTTACAAAGGATTAGGA 4
ACAGACTTAGGTAAATCTCAGATAAACCCTGATGGCTATATTGATGTTTACAAAGGATTAGGA 5
ATAGACNTAGGTNAATTNTCAGATAAACCCTGATGGCTATATTGATGTTTACAAAGGATTAGGA 6
ATAGACNTAGGTNAATTNTCAGATAAACCCTGATGGCTATATTGATGTTTACAAAGGATTAGGA 7

TTCCTGAGTCTCTGCACCTAACCTCAAAAT 1
CAATCCTTTGATCTGACATGGAGAGATATAATATTACTGCTAAATCAGACGCTAACCTCAAAAT 3
CAATCCTTTGATCTGACATGGAGAGATATAATATTACTGCTAAATCAGACGCTAACCTCAAAAT 4
CAATCCTTTGATCTGACATGGAGAGATATAATGTTACTGCTAAATCAGACACTAACCCCAAAT 5
CAATCCTTTGATCTGACATGGAGAGATATAATGTTACTGCTAAATCAGACACTAACCCCAAAT 6
CAATCCTTTGATCTGATATGGAGAGATATAATGTTACTGCTAAATCAGACACTAACCCCAAAT 7

GAGAGAAGTGCCGCCATAACTGCAACCCAAAGAGTTTGGCGATCCCTGGTATCTCAGTCAGGTC 1
GAGAGAAGTGCTGCCATAACTGGAGCCCGAGAGTTTGGCAATCTCTGGTATCTCAGTCAGGTC 3
GAGAGAAGTGCTGCCATAACTGGAGCCCGAGAGTTTGGCAATCTCTGGTATCTCAGTCAGGTC 4
GAGAGAAGTGCCGCCATAACTGCAGCCCTGAGAGTTTGGCGATCTCTGGTATCTCAGTCAGGTC 5
GAAAAGAGTGCTGCCATAACAGCAGCCTGAGAGTTTGGCGAATCTCTGGTATCTCAGTCAGGTC 6
GACAGAAGTGCTGCCATAACTGGAGCCCGAGAGTTTGGCAATCTCTGGTATCTCAGTCAGGTC 7

AATGACAGGATGACAAACAGAGGAAAGATAATGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 1
AATGATAGGATGACAAACAGGAGAAAGAGAACGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 3
AATGATAGGATGACAAACAGGAGAAAGAGAACGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 4
AATGATAGGATGACAAACAGGAGAAAGAGAACGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 5
AATGATAGGATGACAAACAGATGAAAGAGAACGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 6
AATGATAGGATGACAAACAGAGGAAAGAGAACGATTTCCCCACAGGCCAGCAGGCAGTTCACAGT 7

GTAGACCTCATTAGGACACAGAATCAGAACATGGAGATTGGTGCCGCAGACATTTGCTAACT 1
AAT 2
GTAGCTCCTCATTGGGACACAGAATCAGAACATGGAGATTGGTGCCGCAGACATTTACTAACT 3
GTAGCTCCTCATTGGGACACAGAATCAGAACATGGAGATTGGTGCCGCAGACATTTGCTAACT 4
GTAGACCTCATTGGGACACAGAATCAGAACATGGAGATTGGTGCTGCAGACATTTGCTAACT 5
GTAGACCTCATTAGGACACAGAATCAGAACATGGAGATTGGTGCCGCAGACATTTGCTAACT 6
GTAGACCTCCTACTGGGACACAGAATCAGAACATGGAGATTGGTGCCGCAGACATTTGCTAACT 7

FIGURE 9.1

09719554-011801

11/64

TCGGTGCTAGAAGGACTAAGGAAAACCTAGGAAGA---TATGAATTATTCAATGATGTCCACT 1
 TCGGTGCTAGAAGGACTAAGGAAAACCTAGGAAGA---CTATGAATTATTCAATGATGTCCACT 2
 TCGGTGCTAGAAGGACTAAGGAAAACCTAGGAAGA---CTATGAATTATTCAATGATGTCCACT 3
 TGTGTGCTAGAAGGACTAAGGAAAACCTAGGAAGAAGTCTATGAATTACTCAATGATGTCCACT 5
 TCGGTGCTAGAAGGACTAAGGAAAACCTAGGAAGAAGCCCATGAATTATTCAATGATGTCCACT 6
 TCGGTGCTAGAAGGACTAAGGAAAACCTAGGAAGAAGCCTGTGAGTTATTCAATGATGTCCACT 7

 ATAACACAGGGGAAGGAAGAAAAATCCTACTGCCTTTCTGGAGAGACTAAGGGAGGCATTGAG 1
 ATAACACAGGGGAAGGAAGAAAAATCCTACTGCCTTTCTGGAGAGACTAAGGGAGGCATTGAG 2
 ATAACACAGGGGAAGGAAGAAAAATCCTACTGCCTTTCTGGAGAGACTAAGGGAGGCATTGAG 3
 ATAACACAGGG--AAGGGAAGAAAAATCCTACTGCCTTTCTGGAGAGACTAAGGGAGGCATTGAG 5
 ATAACACAGGG--AAGGGAAGAAAAATCCTACTGCCTTTCTGGAGAGACTAAGGGAGGCATTGAG 6
 ATAACACAGGG--AAGGGAAGAAAAATCCTACCGCCTTTCTGGAGTACTAACGGAGGCATTGAG 7

 GAAGCATACC---AGGCAAGTGGACATTGGAGGCTCTGAAAAAGGAAAAAGTTGGGAAAAAGTA 1
 GAAGCATACC---AGGCAAGTGGACATTGGAGGCTCTGAAAAAGGAAAAAGTTGGGCAAAATTG 2
 GAAGCATACC---AGGCAAGTGGACATTGGAGGCTCTGAAAAAGGAAAAAGTTGGGCAAAATTG 3
 GAAGCGTGCC232AGGCAAGTGGACTTTGGAGGCTCTGAAAAAGGAAAAAGCTGGGCAAAATTG 5
 GAAGCATACC238AGGCAAAATGGACTTTGGAGGCTCCAGAAAAAGGAAAAAGCTGAGCAAAATTG 6
 GAAGCATACC233AGGCAAGCGGACTTTGGAGGCTGAAAAAGGAAAAAGCTAGGCAAAATCA 7

 TATGTCTAATAGGCTTGCTTCCAGTGTGGTCTACAAGGACACTTTAAAAAGATTGTCC-AA 1
 AATGCCTAATAGGCTTGCTTCCAGTGTGGTCTACAAGGACGCTTTAGAAAAGATTGTCC-AA 2
 AATGCCTAA 3
 AATGCCTAATAGGCTTGCTTCCAGTGTGGTCTACAAGGACACTTTAAAAAGATTGTCC-AA 5
 AATGCCTAACAGGCTTGCTTCTAGTGTGGTCTACAAGGACACTTTAAAAAGATTGTCC-AA 6
 AATGCCTAATAGGCTTGCTTCCAGTGTGGTCTACAAGGACACTTTAAAAAGATTGTCCAAA 7

 -TAGAAATAAGCCACCACCTCGTCCATGCCCTTATGTCAAGGGAATCACTGGAAGGCCCACT 1
 GTAGAAATAAGCCGCCCC-TCGTCCATGCCCTTATGTCAAGGGAATCACTGGAAGGCCCACT 2
 GTAGAAATAAGCCGCCCCCTCGTCCATGCCCTTATTTCAAGGGAATCACTGGAAGGCCCACT 5
 GTAGAAACAAGCTGCCCTTGCTCCATGCCCTTATGTCAAGGGAATCACTGGAAGGCCCACT 6
 -TAGAAATAAGCCGCCCCCTCGTCCATGCACCTCGTGTCAAGGGAATCACTGTAAGGCCCACT 7

 GCCCAGGGGATGAAGGTCTCTGAGTCAGAAGCCACTAACCCAGATGA 1
 GCCCAGGGGACGAAGGTCTCTGAGTCAGAAGCCACTAACCTGATGA 2
 GCCCAGGGGACAAAGGTCTCTGAGTCAGAAGCCACTAACCCAGATGA 5
 GCCCAGGAGATGAAGGTCTCTGAGTCAGAAGCCACTAACCCAGATGA 6
 GCCCAGGGGACGTAGGTCTCTGAGTCAGAAGCCACTAACCCAGATGA 7

FIGURE 9.2

09719554-014001

12/64

RTPLSTQTVQKDIDKGVNNEPKSANIPWLCTLQAVGEEFGPARVHVFFSLSHLKQIKIDG SDSPTT

KDPFSTQMVQKEIDKRVNSEPKSANIPQLPLQAVGGREFGPARVHVFFSLPDLKQIKTDLGKFSDNPDG

YIDVLQGLGQSFDLTWRDIILLNQTLTSNERSAAITGAREFGNLWYLSQVNDRMTTEERERFPTGQC

YIDVLQGLGQFFDLTWRDIMSLLNQTLTPNERSATITAAKEFGDLWYLSQVNDRMTTEEREXFPTGQC

AVPSVAPHWDTESEHGDWCCRHLITCVLEGLAKTRK TMNYSMMSTITQ GK

AVPSLDPHWDTESEHGDWCCRHLITCVLEGLAKTRKKSMMNYSMMSTITQGR

FIGURE 10

09719554-01504

13/64

GTCTACCTAGCCA-AGGCATATCTTCTTATGTGGAACATCAACCTATATCTGCCTCCCCACTTATGGGA
GTCTGCCTACCCCTCAGGAATATTTTTGTCTGTGGTACCTCAGCCTATCGTTGTTTGA--A-TGGCTCTT
CAGGCACC-TGAACCTTAGTCT--TTCTAAGTCCCAAC-ATTAAATGCCCCAGGAATCAGAGCC--TA
CAGAACTCTATGTGC-TTCCCTCATTTCTAGTGCCCCCTATGACCATCTACACTGAACA--AGATTTATA
TTGGTACCTGTCAAAGCTAAAGTCCCGTCAGTGCAGAGCCATACAACCTAATATCCCTAT-TTATAGGGTT
CAGTTA--TGTATATCTAA-GCCCCGCAACAAAAGAGT-ACCCAT-TC-T-TCCTTTTGTATAGGAGC
AGGAATGGCTAC-TGCTAC-AGGAAGTGGAAATAGCCGGTTTATCTACTTC-ATT-A-TCCTACTACCAT
AGGAGTG-CTAGGTGC-CTAGGTACTGGCATTGGCGGTATCACAACCTCTACTCAGTTCTACTACAA-A
CACTCTCAAAGAATTTCTCAGACAGTTTGCAAGAAATAATGAATCTATTCTTACTTTACAATCCCAA-T
CTATCTCAA-GAATAAATGGGGACATGGAACGGGTCGCCGAC-TCCCTGGTCACCTTGCAAGATCAACT
TAGACTCTTTGGCAGCAAT-GACTCTCCAAACCCGCCGAGGCCACCTCTCTACTGCTGAGAAAGGAG
TA-ACCTCCTAGCAGCAGTAGTC-CTTCAAATCGAAGAGCTTTAGACTTGCTAACCGCTGAAAGAGGGG
GACTCTGCACCTTCTTAGGGGAAGAGTGTGTTTTACACTAACAGCTCAGGGATAGT-AC-GAGAT-GC
GAACCTGTTTTATTTTAGGGGAAGAATGCTGTTATTATGTTAATCAATCCGGAATCGTCACTGAGAAAGT
CACTTGGCAATTT-ACAGGAAGGGCTTCTGATATCAGACAAATGCCTTTCAAACTCTTATACCAA---CCT
TAAA-GAAATTCAGATCGAATA-CAACGTAGAGCAGAGGA-GC-TTCGAAACACTGGACCCCTGGGGCCT
CTGGAGT---TGGGCAACATGGCTTCTTCCATTTCTAGGTCCCATGGCAGCCATCTTGCTGTTACTACCC
CCTCAGCCAATGSGATGCCCTGGATTCTCCCCTTCTTAGGACCTCTAGCAGCTATAATATTGCTACTCCTC
TTTGGGCCCTGTATTTTTAAGCTTCTTGTCAAATTTGTTTCCCTTAGGATCGAAGCCATCAAGCTACAGA
TTTGGACCTGTATCTTTAACTCCTTGTAACTTTGTCTCTTCCAGATCGAAGC--T---G-TAAA-A
TGGTCTTCAAATGGAAACCCCAATG-AGTTCAACTAACAACTTCTACCAAGGACCCCTGGAACGATCCA
----CT-ACAAATGGAGCCCAAGATGCAGTCCAAG-ACTAAGATCTACCGCAGACCCCTGGACCGCCCTG
CTGGC--ACT-TCC-AC-T-A--GCC-T-AGAGATTCCCCTCTGGAAGACA-CTACACTGCAGGGCCCC
CTAGCCACGATCTGATGTTAATGACATCAAGGCACCCCTCTGAGGAATCT-CAGCTGCACAACCTC
TTCTTTGCCCCCTATCCAGCAGGAAGTAGCTAGAGCGGTCATCGGCCAAATTC--AACAGCAGTTGGGGT
TACTAGCCCCAATTACAGCAGGAAGCAGTTAGAGCGGTCGTCGGCCAACTCCCCAACAGCACTTAGGT
GTCTCTTTAGAGGGGGG
TTCTCTGTAGATGGGGG

FIGURE 11

14/64

[illegible]

FIGURE 12

15/64

gtgtgcaattcctctgtctcaactctgtgagagaaacccagcacatctccagcaaacaga
|||||
agtgtgcaattcctctgtcctccactgtgagacaaacccagacacatctccagcacacaaga 2299

acttcaaaacacctgaactgcagcagccaggcggttctctcaggaccacctccccaggat
|||||
acttcgaaatgcctcaacctcaggtgccagggggttctctccagaaccttctccccaggag 2359

cttgcttcaagtcgccggaattctgaccattggggccaagggaatgcctgcagccaggattc
|||||
ctgtctacaagtcgccagaaattctggccactggggccaagggaatgccacagaccaggattc 2419

ctcctaagccacgctcccatctgtgcaggaccccaactgggaatcggaactgtccaaactacc
|||||
ctcctaagctgtatcccatctctgtgggaccccaactaaaaatcagactgttcaactacc 2479

cggcagccaatccagagacccctggaactctggcccaaggetctctgactgaactccttc
|||||
tggcagccaactccagagccctcggaaactctagcccaaggetctctgactgaccccttct 2539

cagatctcttcggcttagcagctgaagactgacactgcccgatcacttcagaagtcacct
|||||
gagatctcttcggcttagcagctgaagactgacactgccagatcgcttcggaagctctaca 2599

ggaccatcacggatactgagcttcaggtaactctccagctggaggctaaagtcacatccct
|||||
ggaccatcacagat-----gtccaggtaactctccagctagagggtaaagtcgtccct 2654

gtttaatcgatacaggggctacccaactccacatcacctctctttcaagggctgtttccc
|||||
tcttaataaatatggaggctacccaactgcacattacctctctttcaagggctgtttccc 2714

tttccccataaactgttgtgggtattgacggccaaagcttcaaaaccccttaaaactcccc
|||||
ttgcctccataaactgttgtgggtattgacggccaggctcttaaaactcttaaaactcccc 2774

cactctggtgccaaacttggacaacattcttttatgcactcttttcagttatcctcacct
|||||
aaactctagtacaaacttagacaatactcttttaagcactcctttttagttatccccactt 2834

gcccagttcccttattagccgagacatttaaaccaaatatctgcttcccgcactattc
|||||
gcccagttcccttatgagccgagacacttcaactaaatctctgcttccctgactattc 2894

ctgggtacacggcacatctccttgcgcgcctcttctcccaacccaagcctccttcatatc
|||||
ctggactacagctacatctcattgctgcctcttctcccaatccaagcctcctttgcatc 2954

ttctctcatatccccccaccttaaccacaaagtattgggacacctctactccctccctgg
|||||
ttcttgtt--atcccccaaccttaaccacaaagtataaagtaacctctattccctccctgg 3014

FIGURE 13.1

[illegible]

16/64

[illegible]

FIGURE 13.2

350

17/64

atataaactcacaaaaggaaacctgactgacccccatagattctaaatcccttccccactc
 |||||
 atataaactcacaaaaggaaacctgactgacccccatagattctaaatcgcttccccactc 3898
 |||||
 ctctttccattccttgaagacagcttttagagactgctcccacactagctctccctgtctc
 |||||
 ctctttccattccttgaagacagcttttagagactgctctccactctagctctccctgactc 3958
 |||||
 atcccaacccttttcattacacacagcgaagtgcagggtgtgctgcgaatctcttac
 |||||
 atcccaacccttttcattacacacagctgaagtgcagggtgtgctgcgaatctcttac 4018
 |||||
 acaaggacgggacattgcctgttagcctttttgtccaaacaacttgacctactgtttt
 |||||
 acaaggacgggacattgcctgttagcctttttgtccaaacaacttgacctactgtttt 4078
 |||||
 aggctcgccatcatgtctccatgcggtagcttccgctgccttaatacttttagagccct
 |||||
 aggctcgccatcatgtctccatgcagcgtctgctgccaccttaatacttttagagccct 4138
 |||||
 caaaatcacaaactatgctcaactcactctctacagctctcacaaactccaaatctatt
 |||||
 caaaatcacaaactatgctcaactcattctctacagctctcataaattccaaatctatt 4198
 |||||
 ttctttctcacacctgacgcataatactttctgctccccggctccttcagctgattcact
 |||||
 ttctttctcacacctgacacataatactttctgctccccggctccttcagataatactcact 4258
 |||||
 ctttgttgagtctccacaaattaccattctctcggccagacttcaatctggcctccca
 |||||
 C--catttattctccacaaattaccattattcctggcctgacttcaatccggcctccca 4316
 |||||
 cattattctggataccacacccctgacctgatgattgtatgtctctgatctaacctgacatt
 |||||
 cattattctggataccacacccctgacctcatgactgcatctctctgatccacctgacggt 4376
 |||||
 caccacatttccccatatttcccttctttctggttctcatgtgatcacatttggtttac
 |||||
 caccacatttccccacatttcccttctgacctgtttctcaccctgatcacacttggtttat 4436
 |||||
 tgacggcagttccaccaggcctgatcgccactcaccagcaaaggcaggctatgctat
 |||||
 tgatggcagttccaccaggcctaactgccactcaccagcaaaggcaggatagctat 4493
 |||||
 gaactgattgccttaactcgggccttctactcttgcaaaaggactacacgtcaatatattat
 |||||
 gaactgattgccttaattcaagccctcactcttgcaaaaggactacgtgtcaatatctat 4553
 |||||
 actgactctaaatatgccttccatatcttgcaaccacatgctgttatatgggctgaaaga
 |||||
 actgattctaaatatgccttccatatcttgcaaccacatgaggctatgggctgaaaga 4613
 |||||
 ggtttctctcactacgcaagggtcctccatcattaatgcctctttaaaaaactcttctc
 |||||
 ggtttctctcactacacaagtgtcctccatcattaatgcctctttaagaaaa-ctctgctc 4672
 |||||

FIGURE 13.3

09719554-01301

18/64

aaggctgctttacttccaaaggaagctggagtcacacactgcaagggccacccaaaggcg
|||||
aaggctgctttacttccaaaggaagctggggtcattcactgcaaggggcatcaaaagact 4732

tcagatcccattactctaggaaatgcttatgctgataaggtagctaaagaagcaccttagc
|||||
tcagatcccattgctctaggcaatgcttatgctgataagggtggctagacaagcagcttagc 4792

gttccaaacttctgtccctcatggccagttttttctccttcccatcagtcattcccacctac
|||||
tctccaaactttgtccctcatggccagttttttctccttcccatccgtcactcccacctac 4852

tcccccatgaaacttccgcctatcaatctctcttcacacaaggcaaatgggtctcttagac
|||||
tccacagctgaaacttccacctatcaagctcttccccgcgaaggtaaatgggtctcttagac 4912

caaggaaaatatctccttccagcctcacaggccattctattctgtcatcatttcataac
|||||
caaggaaaatatctccttccagcctcacaggccattctattctgtcgctatttcataac 4972

ctcttccatgtagggtacaagccactagtcacacctcttagaacctctcatttccctt-cca
|||||
ctcttccatgtagggtacaagccactagcctgtctcttagaacctctcatttcccttcca 5032

tctgggaaacatatcctcaaggaaatcacttctcagtggtccatctgtctatttctaactac
|||||
tctcgaaatctatcctcaaggagatcacttctcagtggtccatctgtctatttctgcctacc 5092

cctcagggatgttgcaggccccctccccctcacatcaagctcggggatttgccccct
|||||
cctcagggatgttgcaggccccctccccctcacataaagctcggggatttgccccct 5152

gccaggactggcaaatgactttactcacatgcctcgagtcaggaaactaaaatacctc
|||||
gccaggactggcaaatgactttactcacatgcctcggtcagaaaactaaaatatctc 5212

ttggtctgggtagacactgtcactggatgggttagaggcctttcccacagggtctgagaag
|||||
ttagtctgggtagacactttcactgggtgggttagaggcctttcccacagagcttgagaag 5272

gccactgcagtcattttctccttctgtcagacataattccttggttggtccttcccac
|||||
gccaccgggtcattttctccttctgtcagacataattccttggttggtccttccccttc 5332

tctatcacgtccaataacggagcagcctttattagtcacatcacctgagcagtttttcag
|||||
tctatcacgtctgataacggagcagcctttactagttcaatcacccaagcagtttttcag 5392

gctcttggtattcagtggaaccttcgtaccccttactgtcctcattcttcaggaaaggta
|||||
gctcttggtattcagtggaaccttcatacccttaacatccctcattcttcaggaaaggta 5452

gaatggactaatgggtctttttaaaaacacccccacccaaactcagcctccaactttaaaaag
|||||
aaaccgactaatgggtcttttaagacacacccctcaccaagctcagcctccaactttaaaaag 5512

FIGURE 13.4

09719554-011301

19/64

TGCGCTTTATTTCCGTAGGCTGGTCATATGGCGCTAGCACTCACATAAAGCTACCGAGGAG
 AGCGAATGAAACCAAAATCACCTTTACCTTACAGCAGCAGGCGCTGCTCCCTCTCGATAT
 TTGGCCCGCTGTGTCGCATACCGCCCTCTGGAAGTGGTGATCAATAAACTCCCTAGCTCT
 CGCGCGCTCGACGCCATCTTGCGTACTTTGATCCTCGCAGGAGGACACATCCGCCCTCA
 CTGAGCTCCCTTTTATCCAATAAGAGAGCGGGATGAGTTAAGGAGTGCAGGATTGGCTG
 GAGAACTCGACAGCGTCGGCCATCGTTTCTGCGTGCAGAGATTGATGAACAGAGGTGCGG
 CCCCAGACGGCTCGCGCGGAGAGGCGGTTGGGTACAGAAAGCTTTCTTGTCACACCCAC
 TACAGGCTTACGGCAGGATCGCGCAGGGGAGAGGGGGCGGCGCAGGGGGCGGGGCC
 GATCGATCTCCTCCGGCTCCGACGCTCTCGGCTCGCGGCTCCGGTCCGGGCTCTTTGGCGGC
 TAGGGTGGGCGAACCCAGAGCGACGCTCCGGGACGATGTGGGGCAGCGATCGCTGGCGG
 GTGCTGGGGGAGGCGGGGCGGCGAGTGAAGTGTGGCCCTTCCACCAACGCTCGCGACTGCTTCC
 TCCACTCGGCGCGCGCTCTCGTGCGCCAGCTGCGATCTGCTGCGAGTTAACCTGCGCGGCC
 GAGCCACCTGATCTTCAGCCTGGGGTGGGACGAGGCGGCGAAGCCTCTCAGGAGCGCGCGG
 GACACCGGCTGCCACCGCGGCGCGCGCGAAGCGCGCAGAGATCAGGGTCCCTCGACGCCA
 GGGCCCTTCTGGGTAGTCTCTGGATCCCAAGTCCAGTGCAGGCCCTGGGCTCGTCTTAT
 CCCGAGCTTTTCACTTTGGTGAACCTGAACCTAGAAACGTCCTAATATCTACCACTGTT
 TTTATAAATATTCCTTATTCAGGCTGGAAAAGCTCTGAGAAGTGGTTGTTTATTTATTA
 TTTTAAAGTGTGTTTCTTTCGCGAGCAATTTCCAGTTAACCTGCGCTGCTCGCTCCGGG
 CGCGAGAGCGGGACGCGAGAGTTGTTGGCGGAGGCCCTGTGCGGTTCGCGGAGCTAAGCA
 CGCGCTCCATGAGCGGGAAGGTTAATACAATGATGGTTCTGCGCTGCTGCGTGAAGC
 GGAACACAGCTGTAGTGTGTAGGAACACATAACGTAGTAAATCACTTGAAGCTCTGCG
 GATCAGTGGCCCTTCTGGACGTTTGGTTAGGATGTTTTCAGCTTCAACCACTGGTGGG
 GATACAGCGTCCATATTTTATAAATTAAGAGGACATGGTCTCAGAGTTTGTAGT
 GTACTTATGGGGGCAAAAGGACGGCGATTGTAATCTCTCAATAAATCTGTGATGATGGT
 ATCCCAAGTGGCTAATCTATGCAATGAATAGAGTTTGCAATATTTCAAGCATCCCTTC
 TTTCCACTGTAGTTACTTCCCATACCTAGGGGAAGATATTTTGGTCCACTGAAACAT
 GAGTTACAGCAATCTCCTATCATCGTCGTTATTTATTTTACCCTAAGTAGACAATC
 TTTTGGTTTTTGTAGGGCTTTATGGCTAGAGACAAATCAGTCACTGTCACCAAGTCCAG
 GTAGAAGTTGGTTCAGTGCTCTGTGAGCTTCGATGGGATTTTCAACATGTTTTCAATC
 TGCATCTAATAGTAGGAATGCTTTCTTACAGTAATCTAATTTGATCCTAAGATGTAGT
 GTTACCTTACATTCATCACTGTTTAAAGAAATTTAGTGGTCTTGACTTTGTTTTAAATTTT
 GAGCCTTCGGGAAGTACTTATAAGAAATTAATTCATGATATCTTTTGAATGTAAATGT
 CTTTAGCCCTGGAACAAATGCTGTTTCTGTTGAGCCATATTAGCAGAAATAGTCAACT
 TTAATTTCTAATTATCAATGTAATAAGTTTATTAATTTATAGATTCCATAAATCTATACA
 TTTATCTCCGTGATGAATATATAAATTTATAGAATTTATGTTTTATAGAAAATTTGGAAA
 GCATGGAAAATTTATTAACAAGAAAATTAAGTTACCCATAATCCAGAACTTAGAGGTGACT
 AATGTTGACAGTTTGGATCAAATCTCCAGTTTGTGTTCTAATCTTTATTTTAAACATA
 ATGAGGTCCTGTATACACAGTACAGTTTGTGTGCTGCTGGTGTGTTTTATTTAATGTTATTA
 TGAGTGTGTTTTATTTGTTAAAGGTCATATTTAAGTTGTTAATTAGTATTTCTAGCACA
 AATTTGCCATAATTTATTTAATGTTTACTATGATTGACCATTTAGATTGTACTTAAATTT
 TTAGCATTAGAAGTGATAAATATATTTTAAATCAGACGTTGAAAATAACACATCTTTGT
 TTAGAAAACATCATTTTATTTCTGGTTGCTAGGATAGATTCCCAAGAACTCTGGGTTAG
 AGGCCATAGATAATTTAAGAAAGCAGAAAGATTCAAGTGGGAGTTAATCATGGAATTA
 CTTTATTTGGGGTAGAAGCATTTAGTGCAATATACAGATCATGCAAGTAAATGGAAGAGGG
 TTGGAACAATGGTTTTCTGGCCATATGTCAGACTTACCTGAAGCTTTTAAAGAAACAGAT
 GTTGTGATCAACCCCTCAGACCTATTAATACAGACCTAAAATCTTAGGGAATAGGCTTTAG
 GCATCTCTAATTTTAAAAAATTTATTCAGGCTACTTGGATGCACAAAAGAGTTGAGACAT
 ACTGCTCCAGAAATCATAGAATTTAATGACATAGAGACCTTAAAGCATCTAGGTCGTTTC
 TGACTTTTACATGTAAGGAACTGGCAATCTAGGCCAGTACCATTTGCCATGCACTGAT
 TTTGCCCTCTGTCATAGCTCACTGCAATCACCACCACTACGCTTCTCACTGTTCTCT
 CTATAACCAATCTCTCCCACTTCTGTCTCTTACTCATGCCATCTCTCCCTCAGTCAT
 TTTTCTTCTTCCATACAAAATCCATGCTTTTAAAGGAAGTAATCTACTCTCTCCACA

FIGURE 14.1

20/64

TAGCTTTCCAATTCTCTGTGGCCACATTTGCTCCCTTTCAATACTTCTCTGTGTGTT
 ATGTGACACATACATTTTGATATATCTCTGTACTGTGTTTCAAGTATTGATTCTCTCTGTT
 TACTCAAGTCAATTATTTCAAGACTGACTACCCAGTAGATGCTTTAAGTCAGGATTTCTCA
 ACCTTGGCCTCTGTTGACATTTTGAGCTGGATAATTTTTGTTTTGGGGGCTCTCTCTGTAC
 ATTTTAAAGATGTTTAAACAGCACCTTGGCCTCTATCCAGTAGACGCTGTACTGCCTCCC
 CCTATCTGTGACAAACCAAAAGGTCTTCAGACATTGTGCAGATGTCTACTGAAGGACAAAA
 TCACCTCTGTGTTGAGAACCCCGCTTCAACTAAGTTATCTTCTCTGTACTCAGAATCTGA
 TGTGATTGTCAGCAGGGGGAGAGGATTTCATATACACAGTGATGCAAAACGAACCTAAATCA
 CCATTCCGATATGGCCACACAATTTTCATTCCCTTGTGTTAGCAAGAGATACCTTAGGC
 TTTGGACCTGATTATTTCTAAGGCATTCTGATGTTATGGTTTTTACTGTCAGATTTCTCGGT
 AATACTGATACCTCAGTTTGGGTCAAAGAAGGTCAATTAATTGATTGATTGATTGTTGACT
 CCTGGAAAGACGCTCCTTTCTAGCTGTCTCTTCTCTCTTAACTGAATAGCCAGGGC
 TCTGTGGTTCAAGTGAAGTATTTTGACATAAAAAATAACTTGAACATTGGTCTGCAGAG
 TTGTCTCAATATAACTGAGCACATATTGTGGCTTATGAGGACTGGTTACTACTTTTTGAC
 CAAATAAATAATTAGAAGTATTTTTCTCTCAATAAGGTTTCATTTTTCTTTTTCTAGT
 GAGCTGGTAGAGTTTCTTTTTTGATATTTCAAGGCATCTTTTCATATTTCCATCTCTTAA
 GTTTCTTCATATGAAGTAGAATTTATCTGGATTATGATTGCTGACTCTGATGAAACCC
 ATAGAAAGCATCTGGGGCTTGATCACCTTCATTCTTTGTAATAGCTCACAGGGTTACAGCT
 GATATGTGTAACTTAAGACTTTTGATTCCAATCTAGGCAAAATACACTCAGTTGAAAGAA
 TTTGTCCAGCAGAACAGTTGGACTGTTCTGTGAAATTTGTGAGAAAAATACACAACATA
 GTGATACATGATGATGCTTTCTTAAATATAAAATTTGTAATACATGGTTAAATTTCCAGT
 ACGTTATATTTGTCCCAGAAGTGGCTCCAACATGTTTGAATTTGTCTCATTTAAAGAA
 CATAAGCTGGCTGTTGGTGGCTCACGCCGTGTAATCCAGCATCTTTGGGAGGCTAGGCAAGG
 CAGTACACTGGAGTTCAGAGTTTCAGACACAGCTTGGCCAACTGTTGTAACCCCATCTC
 TACTAAAAATACAAAAATAGCCGGGCTTTGGTGGGGGCTGTAATCCAGTACTCTGG
 CAGGCTGAGGCAGGAGAATTGCTTGAATCTGGGAGGTGGAGGTTGTCAGTGAGCCGAGATT
 GTGCCACTGCCCTCCAGCCTGGGTGACAGAGTGAGTCTCCGTCTCAAGAAAAAATAAA
 AAAAGCAAGAAAAATAAAGACTGGGCATGTTGGCTCATGCCGTGTAATCCAGCATCTTTGA
 GAGACTGAGGTGGGAAGATCACTTGAGCCAGGAGGTTAAGGCTGCAGTGAGCCGTGATT
 TTGCGACTGTACTCGAGCTGGGCAACAGTGAGATCTGTCTCAGGAAAAAATAAAATTT
 GCATGTAAATGAATGAATTTGATATTTAATATTTTAAATATGAAAACTGTTCTGTAGAG
 ATGTAGATCTTGCCATGTTGCCAGGCTGGCTTTGAACCTCTGGGCTCAAAACATCTCC
 TGCTCAGTCTCCAAAGTATAAAGATTACACATGTGAGGCCACTGCACCTGGCTTAATAT
 TTTTAACTTAATGAATTTATTTTGATATAAATAAATTAATACACTGAAGCTCTCTGTATA
 TAATAAGCTCTTTTGTGTGTGTGACGGGTTCTCACTCTGTGTCAGGACTGGAGTGTAAT
 GGCATCTGATGGCTCAGTGTAGCCCTCAACCTCCCTGACTCAAGTGATCTCTCCACCTCG
 GCTTCTCTGAGTAGATGGGACCAAGGCGTATGCCACCACTGGCTGATTTTAAAAATTT
 TATTATTGATACATATTATAAAATATTATTTATTTTAAAAATGATATATGTGGCTGGGC
 ATGGTGGCTCATGCCGTGAATCCGACAGTTTGGGAGGCCGAGGTGGGAGGACTCACTTGA
 GACCGAGAGCTTAAAGACAGCTTAAGCAACATATGTGATAGTATCCATCTCTATAGAAAAA
 AAATGGCTAGGTGTGGTGTGTATGCTATATTTCCAGCTACTCAGGAGACTGAGGTGAG
 AGGATTGCTAGAGCCAGGAGTTTCAAGTTACAGTGACCTATGATTGTGCCAGTGCACTC
 CAGCCTGGGCAACAGAGCAAAATCCTGTCTCAAAAAAATAAAAGTTGCAAAATGCTTAT
 GATGCAATATAAGTAGTGAAAAAGGATTTAAATTTGTGCTATATGAACACAACATATAG
 AAAAATTTGCACATAGAGAAAAGGATTAAACAAGAAATAGACCAAATTTGTCACATGGTTG
 TCTTGTGTTGGAGAGAATATCAGTAGTTTCATTGTTTCTTCCCAAGTTTATATGTTTTC
 CGAGGCTCTCTAATGAGTTTGTAAATTTGTTAATCATAGAAAAACCTCTTTTGTGCTCTTG
 GCCACAACTTACATGTTTAAATGAATTTGCTTTTTTAAATGAGAAATAAATGTATATTTT
 GCTTTTTTAAACCTATATTTCCCATGTTATATGAGCCCTTACAATATTAAAGAGGCTGC
 ATAATATAACGTTTCTGGAAGGGTACAGAAGAAACAGCAGTAATTACCTCTGGAACAGA
 GACATGGCTTACATTTTACCTTTTGTACGTTTTGTGCTTTTTGCCACATGCAATTTATTA
 TTCTTCAATAAATAAGTAAATAAATATGGAATGTATGATACCTCATCTGGTTGGTGTTCAT
 AATTCATAAATATATGTCTACATTTTAAAGATGATATGTGTTTCTACTTATTAACGTA

FIGURE 14.2

21/64

TATGTTAAATAGTAAATTTATATCTTATTTAATAATTTCCCTATTGATAGACATTTAAG
 ACAGTCTCAAGTGTTCACTATCATAGAAAATCTGCACAGATAGCTTTTGCTATAGTTTC
 TTTTTCCTTGAATCGTTAAATGGGAATAAATGCTCAAATAGTTATATGTGGCTCAACTG
 CTATTTAAGTTTATTGACTGACTGCTGCCATTTGAATTTCTGAAGGGGTTGATTTAAATTT
 ATATGCTGCCATAAGAAATATAAGGGTATTGGCTTCATTAGATCCACAGCATTTGGGTG
 TTGGAATGATTATAGATTTTTAAATGCTACACAAATGTAGATAACAGAGAACTATCTA
 TAGAATCTCTTTTGGACATGTGAATTTGAATAATAGTTTATTTCTATGTGAATCCAGAAA
 AATGTATAGAAAACCTTTTTCTCTCATTTCTTATATGAATAGAATCAGAGTTATAGAA
 GTGCTCTGGAGTCCAGCCCTGCATTTCTTGAGCTGGGTGGGAAGGCAGGCATTTAGTGAT
 GGGGGACAGGTAAGCACATGTGTAGGCAATACTTTCTCTAATATCACATAATATAGCA
 ATAGAAATAAATATAAAGTTTAGATTTTTTGTAAAGGAGGTGAGATGTCACTTAATTT
 GTATGCTTATATGAATAGTCTAGGATATTGAAGCTGACTATACTCTGTTTTTAGTGTA
 TTTATCTTGATGTTTACCATACTCCTACTTGCTTCTTATTCTACTATTAACTCATTTTC
 CACATCCCTAATTTTGGTTTCATGAAATATTTTTCTCTGAATTACTAGGTTCTACT
 TACTATTATTAACCTTTATTTCTGACATATTTTATAACCTTCCATGGTCTCACTTGTATTA
 AAAATAAAAAATTCAGCTGGGTGCGGTGGCTCACACCTATAATCCAGCATTTTGGGAGG
 CCAAGTTGGGCGGATAATTGAGGTGAGGAGTTGGAGACCGACCTGCCAACGCTGTGGAA
 ACCCCCCCTCTCTACTAAAAATTCMAAAATTAGCTGGGCATGGTGAGGTGCTGTAT
 CCCAGTACTCAGGAGGCTGAGGCAGGAGAATTTGCTGAACCTGGGAGGTGGAGGTGGCA
 GTGAGCTGAGATTGCATGCTGCATCTCAGCTGGGTGACAAAGCGAAACAATGTCTTGA
 AAAAATAAAAAATAAAAAATTTCTACAACACAGGGTTATTTATTTTCCATTTTGTGTTT
 CCGTTATAGTTTAAATATGTTTAGATTATAAACCTGAAAGCTTGAATACCTATGCTTATC
 TTTGTTTTCTTATGTTTATCAAGTTATTCCTTTAAACATTTTCTAACTGTGAAGAATA
 TGTGAGGCTGGGCTCAATGGCTTATGCTGTAACTCCAGTGCTTTGGGAGGCCAAGGTGG
 GAGGACCATTGAGGCCACGAGTTCAAGATTAGCTGGCTAGGCAACATAGCAAGACCT
 ATCTCTATAAAAAAATTAATAAATTTAGCTGGGCATGGTAGCAAAATGCTGTAGTCCAG
 CTACTCAGCAGACTGAGGTAGGAGGAATGCTTGAGACAGGAATTTGAGTGACCTATGAT
 TATGCATCCAGCCCGGGCAATAGCAAGACCTATCTCTTAAAGGAAGAGATGTAGTAA
 TAATACATATTCATTATACTATTTTACCATTGAAAGTAAAAATAGAGTTTTACCTTTT
 CCCAGTCCCCTCAGAAATGGGGATCTCAGTAGACCTTTAGGATTGGAAGATGAGATC
 ATTATATTTTCTGCAATTATTACCCCAAAAAATTTTACAGATACCTTTCCATGTATTAC
 AAACATGTTGCATTTAACTATGTCTCTCTCTCTCTCTCTGCTGTGCGCTTCTATGA
 TCCTCTGTGTGGAGCCCTGCCAGTAAGACACTATCTCTGGAAGAATCACTGATAGGAACAG
 AAAGTGGACTGGCTAGGCCAGGAGTCTCTAGCTTCTTAGGGGGCAGGAGCTGCTTTGTGC
 TTTCTCAGAAATCAGATATATATGTGGACTGAAACATTTAAAAACAGAAATAGCAAGGGTG
 CTATACGTTTAAAACTTATATAGATGGGGCTACATTGCTCTCTATTACTAATTTCCCATG
 ACAATACAGAGAGTGCCATGTCTTTTTTAACTGTTTGTAGCACAGACTAATCTTGTTTAA
 TGCATGTTTTTGTATGAGAATAGGCTACTCATGAGAAATCTGAACCTAAGCACTAGTCC
 CTGTCATCTCTAAATTTGTTGCTAGAATCTTAAAAATTTAGCACACAGGACCTTAGAA
 ATCATTAATCTTGGTCTTTGTTCTACAATACAAGGAGATGGAATATTTTACCCAGGAT
 GCTTAGCAGGTTACAGTTCTGCCCTCTGAGTACCAGCACTTCCCTGTGGGCAACATCAA
 TTTCTGATTTTCAAGTCTTAATTAGTACTCTGAAGAATCCTACTTGTTTTAACTCCCA
 CTTGCTTGAAGTGACTTTACCTGATTTTTTTAGATCCCTTATTGACGAAATGCCACTAA
 GAACTGAGTCTCTAGCTTCTTGGTGGGCAGGAGCTGCTTTGTGCTTGCTCAGAAATCATC
 CTTTTCAGTAAGGGAGATATTGAAGAGAAATCTACTGAGGAGTCTGGGGGTGAGGCATC
 AGGGAATCCTGCTCCAGTCCACAAAAGCAGAGGAGGAGGTTGGTTACCTAGAGATGTT
 AACATGCAAGGCTTTGGATTTTACTCCTTTAATCCTTGAAGATGCTCTGGAAGGGGAA
 AGGAAGTAAAGTGGTGAATCCAGCTTATAGACATACTAGTGTACATATTTTAACTAT
 AATAGGAGGATATTATAGTTTACTTAACTTCACTGTGAAGGATTATATCTCTCAAT
 ATTTGCTCCAGTGCTATTTTCAAGTATTTTCACTTTTCTGAAGCAGCATGTCTGTT
 GCAAACTCTAGAAAATATGAGAATTTTATATATAGATCAAGCCATACTTGTATGAT
 ATGATCATTTCTCTTATATTTTACTTACATTTTACATTTTATGATTAATCTTCTTAT
 TTTGAAAAATATGTCATGCTGAGATGATTTTTTCTTCTCTGTAATAGTTATGAAACA

FIGURE 14.3

THE
JOURNAL
OF
THE
ROYAL
ANTHROPOLOGICAL
INSTITUTE
OF GREAT
BRITAIN
AND IRELAND
PUBLISHED
BY THE
PUBLISHERS OF THE
JOURNAL OF THE
ROYAL ANTHROPOLOGICAL
INSTITUTE OF GREAT
BRITAIN AND IRELAND
LONDON
1901

FIGURE 14.4

23/64

CGTTCAAGTGGTTCCTCTGCTCAGCCTCCTGAGTAGCTGGGACTACAGGCATGCACCAC
CAGCGCTGGCTAATTTTTTGTATTTTGTAGTAAAGCTGGGTTTCACCATGTTAGCCAGCC
TGGTCTGGAACCTCTGACCTCAGGTGATCTGCCTGCCTCGGCTCCCAAAGTGCTGGGAT
TACAGGCATGAGCCATGCTCCTGGCCGGCTACATCATTTTCTAAAGCTCCAGACCATTT
CTTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCT
TTCT
TTAGAAGCTTGTCTTTGTGCCAGGCTGGAGTGAGTGAGGACCACTCCAGCTCACTACAA
CCTCCACCTCCAGGTTCAAATGATTCTCCTGCCTCAGCCTTCAGAGTAGCTGGGACTAC
AAGTGTGCGCCACCACTCCTGGCTAATTTTTGTATTTTGTAGTAGGAGCAGAGTTCCACA
TGTGTGGCCAGGCTAGTCTTGAAGCTCTGGTCTCAAGTGATCCGCGCTGCCTCAGTCTCCCA
AGGTGCTGGGATACAGGCGTGAGCCACTGCTGCCTGGCCTCAGATCATTTATTTCTGTGA
GCTTTAACTGTCCGTTCCAGGATCCCACTGCATCCTCAAATTCAAAATATCAACACT
GAGCTTATGATTAGCTGGTCTGTCTATTAGATGGGAATCTCTTTATTTCTCTGAAAT
TATATGTTGAGAACAGGAGAAGTCTGTAGTGTAAGTCTGTGATTAAAGTAGCAATAA
GGACTCCGCCCTTCCCACTCCACTGAAGGTTGAAGAGCCATGGACAATGAGAAGTCACAG
TAGGTGAAATCAGGTACTAAAATGGACTTGGCTTGAGAGATCAAAAATGATCACTTGGTG
ATACAACTAAACAAATTCATGTTAACTGAACCTTTATTACCCCTGTGAAGCATGGTGATTA
AAAAAAACAAACAAACAAACAGGAACTTGATTGTTAAATTTCTCTTTAAGTCAGAATATG
TACCTTAGAGTTTATTATTATGCTTTTGTCTACCACTTAATATGTCTGCACCTGCTCTTTA
GAAGTTAATAGAGAGTAAAGTCGTCTTTATGTCTTTTCAAGTCTTACTTATATTGGGAAG
TTGAGAAAAATTTTTTAACATCATATTATGATATATATATATATATATATATATATATAT
ATATATATATATATATATATATATAGATAATTTTTTTTTTTTTCTTGAGACGGAGTCTCACT
CTGTGCGCCAGGCGCGAGTGTGGTGGGATCTCCACTCAATGCAAGCTCTGCTCCCGAG
TTCAAGCGGATTTCTTGCTCAGCCTCCCGAGTAGCTAGGATACAGGCTCCCAACCAAC
GCTCGGCTAATTTTTGTAGTTTGTAGAGACGAGGTTTCAACATATTGGCCACGCTGGT
CTCAAACTCCTGACCTTGTGATCCGCCACCTCGGCTCCCAAAGTGTGGGATACAGG
CGTGAGCACTGCGCCCGGCTGAGGTAAAATTTAAAGTGACATAATTCAGTCATTTTGTAG
ATATTATACCTAGTTGTACAGCCATCACCACAATCTAAGTTTAGAACATTTTCATTAGGG
GGTGGGAGAAATTTTACTCTGCTTTTGTAGATTAAAGTTTCTGTCTGGATCTAATCAATTAA
TCAGACATCAGGCAGATTGTCTGTGATTAGTTTGGCCATCCAGCTTCTTCATTGGTT
GTTAAGTTTACAAATAAAGGCTGCTCAAAGATTAGAAAATAACATTTAATTTGAATGTAA
ATGTGCCATAGTTTAAAGATGGGTTTGGTGAATACAGTCAAATACATACATTTAAAGCT
CTAATTTCTGAAGATTATGTAAAGAAAAGGAAAAGAAATGTAGGGAGAGGATTGAAATGGTTC
ATGGTATAACAAATCTGAACATCCATCTGGTCAACCGTTGGTATTGGAATGTTTTGTCT
CTCCTCAAATTCATATGTGCAAAATCCCACTCCCAAGGTGATCGTATTAGGAGGTGTGGT
GTGTGGAGAGTATTAGGTCATGAAGGTGAAGCCTTCATGAATGGGATTCTGTGCTCTTAT
AAAAGAGAATGTGAGAAAATAAGTTTCTGTCTGTTGTAGCACCCAGTTTAGGATATTT
TGATATAGCAGCTGCATGGACTGAGACCACTATGAGTTATTATGATAGCTTCTGTTATT
TCACCTAAATTCATAGAAGCTAATATATCAATATTTTTGTATGAAATATTCTTTAAACA
AGCTTGAATATATTATATTTTGTATTATTTAAATTCAGATTCCAGATGACCTGAG
GAAGAGCTAAATATAGAAATGCATGCGGTAGTCAGGATACTCCAGTGGAGTTACCCC
TAAATTTCCAGATCTCTAAGATTACACCTCAGAGGAATTTAGTGAGTTCAAATATATA
TGTTACATCAAATTTCTTTACACGTTTTGTAAGATTTCTAGTTGCTTTAGCTAAGTAAT
AAGGATTTGTATTCCTTTTGTACAAATCTTTTTTATTGTGTTAAACTATATATAAC
ATAAATATGCCATGTCTGCCATTTTAAAGTGTATAATCAAAGGCATTAATTACATTCA
TAATATTGTACAAACCATCACCACATCTATATCCAGAACTTTTCCATCCACCAGGAGAGA
AACTGGTACCCATTAACAAATAATCCCGGTCCACTCCTTTCCCGAGTCCCTGGTAATC
TCTAATGTATATTGTGCTCTATGAATTTACTTATTTAGATATTTCAATATTAAGTAGA
AGTATGCATTGTCTTATGTATCTGACTTATTTCAATTAAACATAAGTTTTCAGGCTCA
TCTGTGTTGTATGATCAGAATTGATTCCTTTTCATGGCTGAATACTATTCCATTGACT
GCATATACCAATTTGTTTATCCATTCACTGTGTTGATGGACACTGGGTTGTTCCACAT

FIGURE 14.5

24/64

TTTTGGCTGCTGTGAATAATGCTACAGTGAACATTGGTGACAAATCTGTTTGAGTTC
CTCTTTTCAAGCTCTCTTTGGGATATACCTAGGAATTAAGTTTAACTTTTGGAGAAGCTGAG
AAATCTTTTAAATGATAACACAAATCTTATATTGCCAATGCAAAATGAATATGAATATT
TGGCTTTTAAAGAGATTGATCATTTTGCCACGCTGGTGTAAATAAAAAAATTTGTCCTCATG
TTGTTTTCAGTATTAAATATTGTAGCTTAAAGAGTGTCTAGACTGTTTACTTTTTCATCAG
TTAATTCTTTGGATACTGGTAGAGTCAGGAAATAGAGATTGAACTTAAAGATCTTTTGA
GGTGGGGTCCAGTGGCTCACACCTGTAATCTTAGCACTTTGGGAAGCTGAGGTGGGAGGA
TTGCTTTGGGCAAGAGTTTGAAGAATAGCCTGGGCAACATAGCAAGACCCCATCTCTCA
AAAAAATTAATAAAAAAATTAAGCCAGGCGTGTAGCTCACGCTGTTATCCCAACACTT
CGGGAGGCTGAGATGGTGGATCACTTGAGGTGAGAGTGGAGACCAAGCTGGGCAACA
TGTGGAACCCCATCTCTACTAAAAATACCAAAATTAATCGGGCGTGGTCTAATCCTGT
AATCTCAGCTACTCAGGAGGCTGAGGCAAGGAAACCTTGAAGTGAAGAGTGGGAAGTT
GCAGTGAGCTAGATCTCACCATGCACCTCCAGCTGGGTAAACAGAGCGAGACTCTATT
CAAAAAAGTAAAAATAAAAAATTAGACACATGTGGTGGCAATGCTGTAGTCTTAGCTA
CTCAGGAGGCTGACTGAAGTGGGAGGATCTCTTGAGGCCAGGAGTCCCACTGCGAGTGA
GCTATGATTGTGCCACTGCACCTCCAGCCTAGGCAATATCTCAAAAAAATTTTTCATCAAT
AGATTATTAGGCCAGAGCTGGTGGCTCATGCGCAATATCCCAAGCACTTTGGAAGGCCAAG
CAGGCGGGATCACCTGAGGCGAGGAGTTTGAAGCAGCCTGGGCAACATGGTGAACCCCT
ATGCTACCAAAAAATCAAAAAATTAGCTGCAATGTCTATAATCCCACTACTTTGGGAGGC
TGAGGCAAGCGAATCGCTTGAACCCGGGAGGCAAGGTTGCAGTGAAGTGAAGTCTCGCC
ACTGCACCTCCAGCCTGGGCGATACAGCGAGATTCTGTCTCAAGAAAAAGGAATTTGTTT
TCCTGTCTTTATCGTAGAGGGAGGAAAGGAGAAATGGGGTTTGAAGTGGTTATTGAGTGA
CCACATTATGGTAGATGTATCACTGGGCAATAGAGAAAAAGGAGCAATTTAAACTTTTCCG
CTAAACAGATGTTCTTCCAGGCTACACTGCACCTATTGTGCTAATGTAATGTCAAATCCC
AGACTGTGGCTATAGAACATGAACATCCTTCATTGGAAATTTGTTGGTCCAGGCTACACT
TTATTAGGAAGATCAGATGTTAAAAATAAGGGTGTAAAGTTAAGTTCAGATATGAGGATA
ATTCAATTACTATTCTCTTTTCTGGCAGCTTAAAGACATAAGTGAAGAGACATAAAAACT
GTATTTTATTTCATGGCTACAGCACTCTACTACCACTGCTCTCTTTGGTAAATCATCAGAG
GAAGAATTTATTAGCTGGAACCTAAAGATGGTGAAGTACATTTGTTATTTTGACTTTTTT
TTCTATTAAAAATAGTTGTACATTTTAAATGTTCTTGCAACCTGTACATCTGTGAACAG
TATGTTGAATAGTGAATAATAATTATGATAATTAAACAGTAGTTTTTATGTATTGAAAAAT
ATCTTTGGCCGGTGCAGTGGCTCATGCGCTGTAATCCCAAGCACTTTGGGAGGCCGAGGCA
GGCGGATCACTTGAGGCCAGGAGTTCAGAGAGCAGCTGCCAACCTGGCGCAACCTATCT
ATACAAAAAATACAAAAATTAGCCTGACATAGTGGTGTATGCTGTAGTCCCACTACT
TGGGAGGCTGAGGCGAAGGATCACTTGAGCCAGGAGGCTGTGTCTCTGCCACTGCAC
TCCAGCCTGGGCAAGAGTGAAGCCTGTTGGGGGGAAAAAAGTCTTTAACTTT
AAATAAATTTGACATTTAAATCTTAAATATTTCATCTGTTCAGTACTAATCTGCG
ATTTATTACTTTCTTTTAAATAGGACTGAAGGAATTTCTCTGAGTATAGTTCTTCTTG
GGAAAAAGAAAAAGATAAAATATTTTCTGTGTAGTCCCAATTTGCTGCAGAGAGTACT
TTATCAAGATGAATAGCATGTTATTGAATTTTAAATAAATACTATTGTTACATGATGATG
ATAATAAGATATGAAGTTCCTTGTAAACCTTGCAATTTGAAGTGTATTAAGAACTGCTG
AAGAGTGAAGGAATAACTTGATTTAAATATTTTATTCTGTAATCTCTTAAATTTATCTGT
ACAAATATTGACTTAACCTAAATTTAAAAATGAATGCTTAGCACAATTAACTTCCAG
AATAGAGTTGATCATGTTAACTGGTAAATGGATCATGATTTAAAAATCTCTTAGGATTGA
AACAAATGAAAAAGTAGTTTAAAGGTTGATTTTAAAAATCTTATTTTTACATGCAAT
TTTACTGCACAACCCATCTTATTTGACAGTCTTAAATTCGCAACTCTTCAGAAATATT
ATCAGATCACTTTCTTTGCTTCCATAAGTTTTTTTATTATTATATTATTATTTTTTTT
TTTAAAGACGGTGTCTCACTTTGTCGCCAGGCTGGAGTGCAGTGGCATGATCATGCTG
CACTGCAGCCTCGACCTCCAGGCTCAGGTGATCTCCCACTCAGCCTCCCAAGTAGCT
GGGACCACAGGCGAATGCCATGATGCTGGCTAAATTTTGTATGTTTGTAGAGATAGGG
TTTACCATGTTGCCCAAGATTTGTCTTGAATCCTGGGTCAAGCAGTTGTTCTGCGCTG
CCCACCCAAAGTTGTGGGATTACAAGTGTGAGCCACTGCGCCAGCTATTCTAGAAGTAT

FIGURE 14.6

25/64

TTTAAGAGTCACTCTTTTTTTTTTTTGAGATGGAGTCTCACTCTGTCCACCCAGGCTGGA
 GTGCAGTGGCACACTCTCGGCTCACTGCAACCTCCACCTCTCGGGTTCAAGTGATCTCC
 TGCTTCAGCTTCCCTAGTAGTAGGATTACAGGCGCATGCCACCATGCCCTGCTATTTT
 TGTAGTTTTAGTAGAGACGAGATTTCCACCATGTTGGCCAGGCTGCTCTTGAACCTCTGAC
 CTCAGTGATCTGCCCTCCTCAGCCTCCCAAAGTGCTGGGATTTCAAGTGTAAACACCA
 CACCAGGCCAAGAGTGGTCTTTTACAATATTATTTTTTGATTAGGACATTCATTTCTGT
 CATTAATAATGAAGATACTCTAGTCATTAGAAATTTCAATGTTTTGGAACATAGACATTTGT
 TCTTTATTTTTGAAATGTTATTGAAGGAATACCAATTTGGAGAAGATACAAATGTGAAGA
 TGTGAAAAGGATAAATGTGACACAAATCAAATTTATAGATAAAAAATATACCTGTAAATG
 TATTAAGGCAATAACATCTCTTCGCTTGTGGACATAAATATTTATATTCCTCGGATGG
 GTACATTTGTTATTGTCAAGGGTGTTTAAATAATGATCTTGGATGCATAAATTTATCTCTC
 TGTATAACAGAAATCAGCAATTTAGTTTTCTGGGACCCGAGAAAAACATGCAAAAGACAT
 ACTTTGAAATGTAAAAC TGATTTTTCTTGAACCTGAGTCTCTAGATCCCTATGGTA
 AAGAGAGAAACAGTGAGGAAATGACTTTATCTCTCTTTTTTAAAGCTGAGCTCTTGG
 GGTGAAGAAGTTATGGCCAAACTAGCATGTTAGACATGTTTTTAACTATATCTGGCAG
 AGTTTTCAATGTAATAATATAAGTAGATGTTAATGTCAATAAGTGATCTTAATAAGTCAT
 CAGTAGATATTTTTTCAAGGATTGCTCTATCTTCAAGCTAGCTTATAAATTTGCTCTGT
 CGTCTTTTTTTTTTCTCTTTATTTTATGTTTTATCCATCCCTGGTGTAGGGGATAA
 CCTTGTCTTCTCGATAACAAGAGTCTGAAGCTTATTAGAAATTTTACTTTTGAGAAATG
 ATCGTAGGAGAAGAAAGCAACTAGATATCAGTGGATCATATTATGCTTGAATTAAGCAATA
 ATTCTTAGAACAAATAAATACATTTTAAAAGTTAAAGCCAAAAACATAGTTGAATGTTT
 AAAAATAATTTCAAATTAAGTTATTCCTCACTGCTTGATTTACTGTAATAATTTGGATT
 ATTTGTGTTTTCTCAACTTTTAAAACAAATATTAAAAAATTCCTCTTTGATTGAATGA
 GGGCTAGATAAAATAAAAAAATTTTTTAAACTCCTCTAATTTCCATATTTCTTTATA
 TAATATGGAATCTCTTATAAACACTACCTCTTAGAAGTCTCCACAGAAGCTTTGGTAGA
 TGTAGTAGTAGGATTGATTCTTATAGAAAGTTAATCTGTAATGTTTTAGTAAAGG
 ATTAACGATAAAGTCAAAATGTTTATAGCAGAGTGTATTATTAATATAAAATAAAATCTC
 TTTTTTTTTTTTGAGATGGACTCTCACTTTGTCACTCAGGCTGGAGTGCAGTGTGCA
 TCTCAGCTCATTGCAACCTCCGCCTCCTGGGTTCAAGCAATCTCTCCGCATCAGCCTCCT
 AAGTAGCTGGGATTACAAGCATGCACACACACACTGCTCTAATTTTTTTGATTTTTAGTA
 GAGATGGGGTTTCAACATGTTGGCCAGGCTGGTCTCAAGTGATCCGCGTGCCTCAGCCTC
 CCAAGTGCTGGGATTACAGGCGTGAACCACTGTGCGCAGCATAAAGTAAATCTCTTCA
 GACTCTCATGTGATCATGTAAGTGGCAGGCAGTCACAGTCAAGAAGTAGTTTAAAGTTT
 ATGTTTGTAAAAATATAATCTACAGATTGATACCTGGATTTTATAGGTAAATGTTTAAAGAA
 AATTAAGTTTTTATGTTATCCTCAGTACTTCAAAAGCACCCATTATGATTATGTTGATTAC
 TAACTAAATCATTTGGGGCTAGAGGTGTTTTTTATGTGTTAAGATTCTCTTAAGGAGT
 TCTATTAGGGCAAAACTTTTAGTAACCTGCATATTTTAAAGTATAAAACATTAATTTTAA
 AGCTTGAAGGCTGGGCGGGTGGCTCACACCTGTAATTCACAGCACTTTGGGAGGCCAAGG
 CGGGTGGATCACTTGAGGTGAGGAGTTTGAGACGAGCCTGAGCAACATGTTGAAACCTTG
 TCTCTATAAAATACAGAAATTAGCCAGGTGTGGTGGTGGGCACCTGTAATCCAGCTA
 CTGGGAGGCTAAGGCAGGAGAAATGCTCGAACTTGGGAGGCAGAGGTTGCAAGTGAAGCC
 AGATCAGGCCACTGCACTCCAGCCTGGGTGACAGAGCAAGACTCCGCTCTCAAAAAA
 AAAAAAAGCTTGAAGTCAGATTGCAATTAATCAGTATACCTTCTCTCAAGTAGGGG
 ACAATTTCTAAGATTTTATGCTTTTAAAAATTTATTAACTAGTCTGAGCATGGTGGCTTGT
 GCTATAATCCAGCACTTTGTGGGCGAGGCAGATGGATCACTTGAGCCGAGAGTTG
 GAGACTAGCTGGGCAACATGGCAAAACCCCGTCTCTACAACAAATGCACACAAAAA
 CCAATCAGCTGGGTGTGGTGTACACTCCTGAGTGCCAGCTACTCGGGAGGCTGAGGC
 CAGAGGATCACCTTTTGCAGGCGGTTTGAGGCTGACAGGAGGCTGGGTTACACCACTGGC
 CTCAGGCTGGATGACACAGCAAGCCCTTTCTCAAAAAAAGAAATGAATAAATTAAT
 TAAATTAATTAACACACTGGGAAGGCAAAATTCAGCATTTTTTATAGCTAAATTTTAT
 CTTGCTTCAGTCTTTTATCATGTAACTATGATATTTTTTACAGAGGAGTGAATTCCTTA
 GGGTGCTCTCTCTTGGAGCACATCACTCACAGCCTCCTGGGAGGCCCTTGTCTGGGCA

FIGURE 14.7

26/64

CTGATGTCCTCTTGTTCAGGACTTAGGAATGGAGCTCTTTTACTCAGGAGGAAAGGTA
 AGTGGTTAAGGTGTGTTCAATTTTCTGTAACATTAAATACTTTTCATTTATCTTTCTTT
 GGGTTTTGACCATCTATTATATAGGGTGGGTTTGACCATCTATTATATAGGGTTTATAC
 GACATATGAAAGCATTCAITTTACTAATAATTTCTGTGTGTCTGCTTTTAGGGTTTG
 GGGGAGTGATGACGAATAAGACTGATGTTCTCCATGCCCTTTTCTGTGTGTCAGTTGATAC
 AATTATATGTTTCTTTTATAGGCTATTAGGTGTGTGATAGGGTGTGATTAACATAA
 TGTGAAACCCAGCTTGCTATCCTGTGATAAATACCACGTAGTTGTGGTGTATCATCTTT
 CTACATGCTGAGTTTATCTGCTAATGTTCTGTGAGCTTTTGCCATTTAAGTTTGA
 AGTGATTAGTTTGCAGTTTCTGTTTTGTGTGTCTTTGTCTGGTTTGTCTATCCGTGT
 AAATCTGGCCTCATAAATGAGATGGGAAGTATTTCTCTCCTCTTTTGTTTTTTGA
 AGAGGTTGTATAAAATTGAGGCTGAATCTTGGTGGTGGCCAAATGACAGGAACATTTTC
 TGTGACTGAATATATTGGGAATTCCTATAAAGCAATATTTTCTAGGGAAGTGGAAATC
 AACTTTAGCCCAAGCAATCTGTAAGAGACATTTGACAACTGGATGCCCATGTGGAGAG
 AGTTGACTGTAAGCTTTACGAGGTATGAGTATGGTAACACTCTATATAAATCCCTTTT
 CATTAGAAAGACAGGAATGTTATACATAATGCTGTCAATCTAATAAATACACATATCATC
 TAGTCTTTAACTTTTCTGTTTATCAITTAGTCAATTAATAATTTCTTGGCTTTCTAATGTT
 TTTGATAAAATTTCTAAACTCTCCATATTTAATGGAGGCCATTTTTCTTCTAGCCAG
 AACTTTTTGTAGACTACATTTCTGGAAGTGCTCACTGACACCACTCGAAAAATTAGTAC
 TTAGAATACTACTAATTGGTATAAATGATCTCTGAATTGCTATGAAAACTGGGGAAT
 GGTTGCTTCAGGGGAGAGAAAGTAGGAGGCTGTGGACAGCAATGAGGAGAATTACAGTTT
 ACCATATAACACTTTTGTACTTTTAAAGTCCCTAAACATTTACATTAATATCTATCAATT
 AAAAAAATTTGGGAAGATTTTACTTTGAACAGTTAAATTTTCCCCCATGGGTACCCGTGT
 CATATAGTTCCAACTAATCATGAACCTTGTGATTTTCTGTCTTTGTGAAATTTAACTTT
 GTAACCTACCCAGGAAGTTTGAAGCCAAATTTGTGTTTCAAAATATGCAACTCCAGGATCT
 CTAGGCAGATGCATTTGCAITTTGATTTTAAATGAATCTGTAGTCCCTTACTCTCACTATG
 TTTTCCACATCTCTCTTTTTTATTTTGTGTGAAGCCATCTAAATTTCTCAATGGGATG
 AAACTGGGTATAAATGAATACATGCATACAGGAATATAGTAGCATATTCCTTTTCTTTT
 TCTTTTTTTTTTTTTTGGAGACAGAGTCTTGCTCTGTAGCCAGGCTGGAGTGCAAGTGG
 TGCGATCTCGGCTCACTATAGCCTCCACCTCCAGGTTCAAGCAATTTCTGTCGCTCAAC
 CTCCTGAGTAATTGGGACTACAGGTGCATGCCACCACTGGCTAATTTTGTATTTT
 TAGTAGAGATGGGGTTTCAACATGTTGGCCAGGCTGATCTCAAACCTCTGACCTCAAAGT
 GATCTGCTGCTTGGTTTCCCAAAGTCTGGGATTTACTAGCATAGCCACTGCACCTGG
 CCTCTTTTTCTGAGTTTTATAAAATTTGATACITTTACTGCACGCTTGGAGCTGATTAA
 TTGAACCAATGTTGATGAACAAGTTTTTGTGATGGGTATATTAATAAATATAGATCAAT
 TTTTATAGTTAAATCAATATCGAGCTTTTCTAGTGCTTTCAAAGGACAACCTGAATTTT
 CCCGACATCAAAATGATCTGAAACCATTTTCATATCTTCTGATTAAAGGAAAGGCTTG
 ABAACATGACAAAAACCTTAGAGGTGGCTTTCTCAGAGGCAGTGGATGCAAGCTCTG
 TGTGCTGCTGGATGACCTTAGCCTCATTTGCTGGACTGCTGCTGCCGGAACATGAGC
 AAGCTCTGATGCGGTGAGAGGCAGCGGCTTGCTCATGTGTAATGCATCCACCACTGGC
 TTAAGGCTCTGTTCTTTTGTCACTCAGCAITTTTATGCTTTAAACATAAATCTACTCTCT
 CAGAGAAATAATATATGTGTTATGTTAAGTGTGTGTTTGGGCCCCCTGATGGCATCTAC
 AGTTGTCTCTATAGACTGTAATAGCAAAATTTGGTAGAGTAAAAACAGTGTGAAAATTTCTG
 AACTTCATGTTAGTCCTTTAGGGTTTTTCTACTCTCCCTTACTTATTTGTTTAAATTTACAG
 ATTTACTCTTTTGTTCATTTGACAAATATTTGTCAAATGCTTTGTGCACAGTCTGTATTTCT
 CAAATTTCTAGGAGAAAAAGAGGGTGAACAGTATTAGCGCAGAACGATACATAATATGAT
 GGCTACTGTGTATGAGTAGCCAGCCCTTTCTTGGCTTTCTTGTGATTGCTTTGTATTCTAC
 ATGAGAGATATTCCCTGGGCTTTACAGGTCAATAAATGGAAATTCAGAGAGATTAAATTGA
 CCAAGGTGACCAACAAGGAGATGACAGCATACACTATGCGAGAAGTATACACAGAGTAGT
 GTAGAGCATATAACCTAACTGGGGGTGAGGTGGGATAAGGAGTTATCAGGGAAGGCTTT
 TTTGGAGAGTTGACAACTGAGCCGAGTTTTGTATGGAAGAGTAGAAATTAGCATGAACCA
 ATTTCACTGTAATAAAGAAAGCAAGGAAGCGTGTGCTACAGGCCAAAAGCACAGAGGTACA
 GGAAGTAAATGATATGTTGGGGAATACCTCTGTGACTGGAGCTTAGAGTGCAAGGAGAGGA

FIGURE 14.8

27/64

GTGCTAGGGAGGTGAGGTTGGAGGGTTTGGCAGCATTGCACTTGCTTCAAGGTTCTTAAAGA
GCTGAAATAGATATAAAATGCAACTAAGAGTGGCTTGGATTATTATTACCTAGTGTGTTA
ATCTCAAATTTTGAATCTATAGCATCTATAGGACTGGTGTACTAATCTTCACTCGAT
CTGTTACTGTTCTTATACATAGATCTATTAGTCCAGTGTTTAAGGAGTGGTGCAGATTTC
TAGGTCAGGACGAGACTCAGATGTACATTATTAAAGCTATTTCAGTTCTGACCTTCTCA
TATGAAACCTTTAAGACCTGGGGTAGGAAGAGATTGTTCTGGAAGTCATAGGAATATGA
ACTGTATTTTGTTTAAACAACAATACAGTATGGAAATTTATCACCCTTCCAGAAATATTTA
TTTCAGAGACAAATTTTATCATTCGTTCAATTATTTCATAAAGTCCAGAGTAGGGAAAC
CTCACTAGACATTGCTCTGAGTATATSGTGTGAGTTTGCAGTACCTCTTGTGTCTCCATT
AGATTATTAGGTCCTCAATAGATAAATCAGGGAATAACTAGATGGATTCAATTTTAAAA
GACATGAAGAGCGATACCATACATACTGCACCTTAAAGGTCAACCTTAGATGATCATTA
TTTTTAATGAATGTATAATTTTAAATTTTCACTGTTTACTTTTCCTAAGCTTTTGCACATAT
ATTGCTTAATTTCCAGCTTTGAATGATATGATAAAGAGTTTATCTCCATGGGAGTTTGG
TTGCATCGATTGCCCAAGTCAGTCTCAGCAATCTCTACATCTCTTACTGTTCTTGCTC
AAGGAGTTCCACATAATTTAGTGGCTCCACACATCTCAGCTCTCAATCAGGTAAATCACT
ACTTGTAAAGGATTATTGAATTTATGTCCTCTTTATAGAAATTTTTCATATTTTATTAGT
AATTCTGGCTTTAAATTTATGCTTCTCTTAATGATTTTAAAGGATATGTAAGTCAACATTT
TGCTGCAATTGTGCTAGAGGCATAAATTTAATTTTATAGCCACCTGAAATGTTTATGATG
CGCTTCCAAGAAATGACTTTTGAATTTGTTTCTTGAATGAGAAAGAACAGAG
AGAAATAGATAGATGGCTTTTAAACACTTCAATTAATTAACCTTTTTCCTCCACTCAC
ATAATGGCACTTAGTCCCCTTTGGGAATCATGAGGGTTTATGTTAGTGTAGTGCATGAAAG
AAATATGTTCCAGGACTGGCAACATATTCTAAATTTCTTTAAATTTTTCACCTAGCATCT
ACCTTAATATTAGACCTGTGCTAGTTAACTGCTATTGAAGAACAAAGGATATATATC
TATTATTAAGGATAATAGAAATGTTATTTAGATATTTGTCATTTGAATATGAATATGTTT
GAGAAATAGGTTTATAGGAACCAAAAAAAATTTCTTAAAGGAACCATATATTACTAAAA
ATGCTTCTTATTTGGAGAAAGAAATGACAATCAATTTATTAATGTGATTTTTCACAACTTT
ATTAAGATATAATTTAAGTACAACAACTCACATAAAGGTGACAAATTTGATCAGTTTAA
CATATGTAGATGCCATGAAACCATCACCACAAATTAAGGAACAAACATTTTCATCACTCC
AGAAGTCTCTAGCCCTTTTACTACCCATTCCTCCCTGCTCCATCCCAGACAACCTACC
AATTTGCTTTCTGTCACTATAGATTGTCAACCTGATTTTCTCCAAATATACATTTCAAAA
ATATACAGTTGAATACAATTGGAAATTCGAATTTGTGTTTCTTCTTAGGACACAGAGA
TGTGAAATCTGTGTAATGTAATAAAAAATAAATTTGACTGTGATATAACAAGTTCAC
GATCTTGACCTGCAGCATGTAGCTAAGAAACTGGCGGGTTTGGCTAGAGATTTTACA
GTACTTGTGGATCGAGCATACTTCTCGACTCTCTCGTCAGAGATATATCCACAGAGAA
AGTATGTTTACTATATAAAACCTGAACTTGGAACTTCTTTCTATTGTGGAGAAATGTAA
TTGTAGTAAAGCAAGAATTAATATATTTCCATTGTAGTATTTGAATAGCAGTTTATTGGA
GTAGAAATTAGTGTTTCCAGCTAAGATGATGGCATTTTGAATTTCAATATAGTGAAT
ATAACTAGTAAAGAAGTTTGTGTTATTTTAAACAGAAATAGTTTAAACAATCTGGAC
TTCCAAAGGCTCTCCGCGGATTTCTTCTGCTGCTTTTGCAGAGTGTCAAGCTGCATATA
CTTAGAGACCTGGGTTGGGACAAGATTTGGTGGGTTTCACTGAAGTTAGGACGATCTCAT
GATACTATCCAGTTTACCTGCCAAGGTATGTTTAAAAAAGAAAAAGTGAATCTTACTCC
CAGAAGAACCTGTATATTAGGCTTTGGCTTATGTGTGTCAGCTTGCCCAATCTCGGTGT
GAGTCAACAGTGTTTACTGAGTTACCAATAAATGTCTTAACACTATTTTAGGTACTTT
AACAAATTTTAAATTTTAAATTTTATTTTATTAAGAAATTTAGACCTCACTCTGTCTATCT
AGGCTGGAGTACCTCAAGCTCACTGCAACCTCAACCTCTGGGCTCAAGCAATCTCC
TGCTCAGCCTCCCAGTAGCTAGAACTACAGGCAATGAACCACTGCCCCGGGCAACTCT
TTAATTTCTTAGAGACGGAGTCTTGCTATGTTGCCAGGACAGACAGATTTTAATGTGTA
TGATGCAGTCTTTGATGATAAGAACTTATAATGGAAGTGTGAGGTGATAGTACAGTAA
ATACATTTTGTATGTATAATTTCTGTTTGGCTTTAATCAATTTCAATTTAGTAAAGCAAGAT
AACTGTCTGCTGGGATTGTAGCAGAAATGGAATAGGAATAAACTAGGAGGTAGAAGGTTA
TCAAGGTTCAAGGACTGATGGGTGAAGCTAGATTTCCAGACCCGGGATGTGAGTCTGTG
AAAAGCAGACTTGGCAGGCATAGACGAGGACAGATAGCAGGATAAAGGACAAATGTAGA

FIGURE 14.9

09719554-013501

28/64

TTGTTCTTCAGAAAGATCAGATGGTAGAGTCTAGGAGGTAGTGTGTTTAAATCAGAGATCT
 GAGAGGCAAAGATCATTTGCATGAGATCAGGGACCCATGCAAAGGAGTGAGAAAAAACT
 GGGTTAAGGAGCCTGCTGCATGGCAAATCCTGGGAAACAGTGGCCACTGGGGCTGGGACA
 TGTTGATTGTCAGCCAGGACTGTTAAACCAGTGTGAGAGAAACATGGGTATGGAAGTACT
 AGCTAGCAGGATCATGACCCCGATGCTGGGATGGGCGATCAAGCATTAGTACATGGAGAT
 CAGTACATCCAGATGCAGTACATGGAGACTATATGCGTAACCTGCTGACTTTGGGCTTCT
 TCCAGATTGGAGCAGAGGTAGAGGTGAGTGGGAATATTCTCAATAGAGGGAACTAAATAG
 GCATACCTAATAAAGAGACCCAGGATATTGCAGACAGTAGCCTCATGTTTGGCTCACCTG
 TTCAAAAAGTTTCTCTGTTCTTGAGCAGTGGTGCCTTAAAGGTAACTTGAGAGCAGTC
 GATTATTGTTGACCTGGAGACTCTTGGGATATTTACTATCTTTGATTGAATAGATTT
 AAATGTACACAGCTCTCATAACTTGC CCCATGAAGCATATCCATGAAAGGCACATACTTT
 GTTAAAGATTTGGTTTGACTTTTTAAATGTAGTACTTTTAAATAAAACAGGAAAAATAGA
 AGTTTCTGATGCAGTTATATGCATTTTATAGAAATGTGTTCTTAATTGGAATAATTGTG
 CGTAGTTCCTTTGAGTTCAATTTACAGTTTTAGTAGGAATGTATTTTCTACTGTTGTGAC
 TTGCTGTTACTAAAGAAAGATGGTGTGATTACCATCTGAATTTTTTTCTATACATTGA
 TCTTTAGCTGCTACTTAGTCAATTTCTGTTTAGACTTGAGCTCTTTTTCATATTTTTTTT
 TTTGTTTCTCAGTATCCAGAAATTTTGGCAAACCTTACGCTGGGTAATTCACGAGAG
 AGTGTGATGTTGGCCGCTGGAAACAGGAAAAACCTTACTAGCTGGGTAATTCACGAGAG
 AGTAGAATGAATTTTATAAGTGTCAAGGTATGTTGTCTACTTATCTCTTTTTTTTATTA
 GGTAAATTAACATAAATGTCAGTTAGCCATTTCAAAGTGTAATTTCACTGGCATTATAGT
 CATTACCAATGCTATGCAACCCACCTCTCTCTTAAATTTCAAACCTTTTCAATTCACAT
 CTCTCTTGTCTATCCCTGGCAACCATTCATCTGCTTTTGTCTCTATGGATTTGCTCT
 TTCTGTATATTTTATATAAAACAAATCATGCAATATGTGACCTTTTGTCTGGCTTCTT
 TCACATTGTAAATGTTTTCATGGTTTCATCAGGTAGTAGCATGTATCAGTACTTCATCCC
 TTTCATGACTGAAATAAGTGTACCATACTTTGTTTATCCACTATCAGTGGTGAAACATTT
 GAATGTTTCTACCTTTTGACTATTATGAATAATGTTGTGCTGTAATATTTCATGCACAAAT
 TTCTCCACGGATATGTTTTCATTCTCTTGGGTATAAATGAGGAGTAGAATTTCTTGGGT
 CTTAGGGTAATCTCTAACTTTTCAAAGAACCACCAAACTGTCTTTTCACAACTGAC
 CATTCCCACATAGCAGTGTGGGGGTTCTCTGATTCTCCACATCTTTACCAACACCAATTATG
 TTCTCAATTTGGGCTAGTCTCATTGGAAGCTAGTGGGAGCAGCATCCATCTAT
 TAAAAGTTGTATGAAATGAGTAATGAGCCACCTCTCTCTGTTAGGGCTTATATGTTCT
 TGCTTAAGGCAATCTTCATGCATTGTGAACAGAAATATACATAAATGCTCAGATAAAAGG
 GCAAAACATTTCTAAAGGGAGTAGACAACCTAGAGGCAGGAGACCATCTGAGGCGAGAG
 CTGGGGTTTTATGGTTCTGTACTTTTGACTATATCTCACCAATGTCTTTTGTCAAAGTG
 AGACTAGGTCTAAGTTTTTTTCAGGTATAAGGTGAGTGTGGTAATTAAGGGGCATGCTAG
 CAGATCATTTTGGGTAATGCTTCACAGTCCACCACCTGGTGTGTCATTGTGGTGCAGAGTC
 CAGTATCTTAGCTGTGTAATTTTCAGACATCAGCAATATTAGTTTAAACAAAGGGCAATTAG
 ATTCCAAGACAAAGGAATCGTGATTATTCTAGCGCTTATTCAAAACCTGATTATAAATCA
 GTTAGTAATTTATTATTGTTTCTGTATTATTATTATTCTTTGAGATGGAGTCTCA
 CTCTATTGGCCAGGCTGGAGTGTAGTGATGCAATCTTGCTTACTGCAACCTCTGCTCTCC
 TGGGTTTCAAGCTATTCTCCTGCTCAGCCTCCCGAGTAGCTGGGATTACAGGCTAAATTTT
 TGTATTTTATAGATGGGGTTTCCACATGTTGGCCAGGCTGGTCTTGAACTCTGAC
 CTCGAGTACTGCTGCCGCCCTTGGCCTCCCAAAGTTCTGGGATTACAGACGTGAGCTACCG
 TGCCCAAGCTCAGTTTAGTAATGTATAAATGGGTTTTACCCAGTTTGAATTTACTCTTTTG
 TCGTGTTTTTTTGAGAACTGGCAATGACGGAGAACTAAAAGTGCCAGGCTGTTGCTGCTT
 TTCTGTTATTTTTGCTTAGTTTTTTTTTTTTTTTTTTTTTCTCTGAGACTGAGTCTTG
 TTGTTTACAGGCTAGAGTGGAGTGGCATGATCTCGGCTCACTGCAACCTCTGCTCTCT
 GGGTTCAAGTGATTCTGCTCAGCCTCCCGAGTAGCTGGGATTACAGCGGCTGCCACC
 GCACCCGGTGAATTTTTGTATTTTAGTAGAGACGGGATTTTACCATGTTGGCCAGGCTG
 GCCTGCACCTCTGACCTCATGATCCACAGCTTGGCCTCCCAAAGTGTGGGATTACAG
 GCGAGAACACCCGTGCCCGGCTGCTGCTTAGTATTCTTGTTCCTCTCTAGTCCCTA
 TAGTTCTCTGACTGATTAGGAGAAATGAATTAATATATTATGTTAATAGATATTAT

FIGURE 14.10

29/64

GTGGTTGAATATTAGAAAATCCTTATTTTGGTCACATATCCTGATCAGTAGTTGGTCTTC
TGGAGATAGTGATTTTCTACTAGAGATGACTTTAGGACCTATTACAGGTTTTTTTTTAAAGAT
CCCAATTTAAGGAAAGACTATTCTATTATTGATTTTGTATATGTCAGGGAATTTTATT
CGAAAGGTTTTTCAGTTGGCTTTTAGGGAAGATTATATATCTCTTTTTTTTTTTTGGC
CTTTTCCACATGTTCTAAAAATGATATATTCTTTAACTCCTATGAAATACATTGTTTC
AGTAATTGAAGATGCTGATTAAAGTCATATCTCTACACATTTTTAAATTTGGAGATAGA
TGGGACTTTGCTCCCTCTTACACCATTCACATTATTCACCTTGGAAAACTATTATTCACATA
CTTATGTGGCAGACACTGTTCTGGGCAAGGGATTACGACAGTGAACAAAAGCTGCTTTT
TGGAGTTTACATCTCTACTAGTGGAAAGCGACAACAAGCAGATAGACACATTTCAGTATATA
ATTCACTGTCAGATGGTGGTGGTAAGTCCTATGTAGGAAGAAAAGCAGGGTAAGGAGGCT
TGGAGTAAGTCGGAGTGAGTCATAGATGGACTTGTGAGGAAAGGGTTTCTGAAGAGGTGGT
ATTTGGGCGAGAGATCTAAATAAAATGAAGCAACAAGCCATGAGAATATCCGGGGGAAAAAT
GTTCTGGGCAGAAGCATCAAGCATAGAACCTTGTGGTATGATATTTATCTAGCACACATT
AATTTTTAAAAATGTATAAAGACATCCATTTAATCATATTAAAGATTTCCATGATTCATT
TAGACTTAGTCAGAAACCAATTTATATTTTCTTTTTTAAATAATTTTATCTCAACTCTTA
TTTTACCCAATAGGGCCAGAGTTACTCAGCAAAATACATTGGAGCAAGTGAACAGCTGTG
TCGGGATATTTTTATTAGGTTGGTAGCCTATGAATGTTTTTAAAGTAACTGACGTCTGTGA
TTATTTTATCAATCAGTGCTTTTTTTTGGTCTTTGTTTTTGAAGAACTGATATTTGAAAGCCT
GTGGTTTATGTGAATTATTAATAGCTAGAGGACGTGGATTCTCTATTTCATCAATTAAT
ACAAAACATTTTTAGATATATAAATTTTGGAAATATTGGTTTTGTTTTTACAATAGAAATA
CTCCTCAAAGTGAATCGAAGTGGTTATTCAAAGAAATCTCAGAGTAGATTCTTATATGA
AGCAAAATTAATGCCCCATAATTTATCTCTAAATTTGTGAAGTCTCAATTTCTTTTTTCCCC
CAGTTTCTCAATTTATCTCTTATAAGTCAAGAGTCCATCTGGCCAACTTAATTTTCAGTAGG
TGTAACATATTTGCATATATTAATAAACTGTATATGAATACAGAAGATGGTATTTAAGGA
TGAAAATTAATTTCAAAATGTGATAGCATTTATGGGGAGTTTTTAAATAAAAAGTACTGTT
TTATCTCTCCAAAAATTTTATTATAAAGTATACAGTTAAGAGAATATACATAAAATACAT
ATGCGACTTAAGGAAGAATAATAAATGAATACCTCATGTATTACCCACCAGGTTTACCA
GGAAAAAGCATAAACAAAATAAACCTCTTCCACGTAAATCTCGGGTTAAAGAGAAGTTAT
AGTGGAAAAATATTGGGAGCAAAACGATTAATGAAATACTATCCATTAAAAATGTTAGATG
TTGCAAACTGATTTCAAGGAAAAATTTATAGTGTAAATGTTTAGAAAAAGAAAAAGGTT
AGAAGTTAACCACTTATGTATCTATCTCATGAAATAGGAAAAATATAGATATAAACTAA
AAAAATGTGTTAAAGGGAAAAATAAAGATAGAATGAAGTTTAATGAACAACAAAAACAG
AGAAGCTCACAAAGCCAAGATTTATTTTTGAACCCAGGATCAATTGACAAATCTCTAA
CAAGTTTGATTAGAAAAAGAAAGCATGAATAAACAAATTTTAGGGATAAAAGGGGAAAC
ATCGCTAAAGATATCCAGAAATGTAAAGATAATAAGGGAATATTATGAAAAATTTCACT
GCCAATACATTTGAAAACTTAGGTGACATAGACAAAAACAAAAATGACCAAAATTAGGCA
AAAAAGAAAACAAATCTGAGTAGTCTGTAACCTTAGTAAAAATTAGGTAGAAAAAGTTAA
AGAAGTCTTTACACAAATCAAACTCAGACTCAGTTTTCTAGGAGAGTTTTGCCAAACAT
TCAAGTTCAGAGATAATTTGCTGTCTATTTTGGCCCCAGAGATATATTTTACTTGGCCATG
CATTTAAGAGATAGCTGTGATTTTTTTCAATCACCGTGACAGGGTTTTATATTAGGT
GTTATTTCGCCAGACATCTAGTCCACCTGTTGCCAGATATGGAATTAATATTCACTTATT
TTATTTAAAAATTTGTTAATAAATTAATAAAACAGAAATCAAAATTAATAAAG
TAAAGAAATAAAATATATTTATAGAGAGCCCTTACAAAACAGTACCACATTAATGAGC
TTTCCAAATTTTGAATGGGCAAAATAAATGAATAGGCATTTCAAAAAAGAGGAGGGTG
GCCAATAAGATATATTAATAAATAAATGGTTACTGTGAATAGGAATCAAAAGTTGTTGA
CTATTAGACTAAGAGTCAGTTTTTGTTTTTGATCCCTGTAGTCTATCCAGAAGGCATGGG
TCTTAATAAACACCTTGCACCTCAACAGTTTACTGAATAACAGGGTAATTTCAATAGCCTT
GCCTCTTTAAGGGTTGTTGTAAAGATTAAAAATAATACATAAATATATAAATACAT
TTATATGTATTTATATGTAAATACATACAACTTGCCTCTTTTAGGGTTTGTGTAAAAA
TTAAAGAAAGTATATAAATATATAAATACATAAATAAATACATTCAATATATGTATAT
GAAATCACTTTGCCAACTATGAAGCCTGATTCAAAATAGAAATGTTGTTGTTTTCCCA
GAGCACAGGCTGCAAAAGCCTGCACTCTTTCTTTGATGAATTTGAATCCATTGCTCCTC

FIGURE 14.11

30/64

GGCGGGTCATGATAATACAGGAGTTACAGACCGAGTAGTTAAACCAGTTGCTGACTCAGT
TGGATGGAGTAGAAGGCTTACAGGGTAATAATTATAAATACAGAAATAGATTGTTATAAC
AAATGTGCTCATGTCATCAGATTTTGGTAAAAAATGTTCTTTTCTCTTAGGTTGTTT
ATGTTATGGCTGCTACTAGTCGCCCTGACTTGATTGACCCTGGCCTGCTTAGGCTGTGTC
GACTAGATAAATGTGTATACTGTCCTCTCTCTGATCAGGTGACAATTTTCATATTTAGAGT
CCAAARCCCAACAAATGCTACACTCTTCTCTTTGTGAGCTTTACTCTCTGCCAGGTAAATGGC
AATTGTCTTAGAAGACCAGCTTTCTTAGGGAAAAGCTTTAGCCACTGTTTGCTCAAAGC
ATAAAAGATTTCTGAATTAGATGCAAAAGCCTTTTGTGGCCAGTGCAAGTCTGAAAACCT
TTGATATCTTCTGTGTTGGCTGATTTGGGAAAAAATAATGCAAGAAACCTTAATGTATTA
TATTTTACATTATCTTCTGTTCAAAGATTACATCTTCCATTATCTGTCAAAAATAA
ACTCTGATACAGAATCAAGCATGTGAATCGTAAGCATGTAAAGCAGGTTTCATAGAGATAA
TTCTTCAACTCTTCTTGTGCTGTGTTGTTCCAACTCTTATTTCTCCAATTTAGAAGCAAA
CAAAATAAATGAATGAAAACAGATAGACAAATGAATAGTCAAAGGTATAAGTATCTGT
ATATATGTTACATGTAGCTATTATTTAAATTAATTATAGATTTTCTTTGAAATACCTTCT
TGGCACACTTGCTCAAACTAGAAAATAAGCACTGTGTGAATAAAGAAATATTTACACTG
AAATATTTGTAGGTTTTTGGGTTTTTGTTTTTTTCAGACAAGGTCTCACTTTGTCAACCAGG
CTAGTACACTGGTAGCATCAACAACCTCACTGAGCGCTTATGGCCAGGCTCAAGCAAT
CTCCCCACTCAGCCTCCCGAGTAGCTGGGACACAGGCACAGCTACCATGCCCAGATATA
ATTATTATTAATTTTGTATAGAGATGGGGTCTCCCTGTGTTGCCAGGCTTCTTGA
ATCCAGGGCTCAAGTGATCTCCCACTCAACCTCCAAAGGTGTTGGGATATACAGGCGT
GAGCCACCATGCCCAGCCTTAAGAGTGTTTGATTTCATTTCATTTATATATATTAT
TTCTGTTGGGAAAAAATCCAAGGAAGATAAATAGTAGGCTGTTGGTACATTTCTCAAC
TACTTTATAAGCTTTTATAGATATAAAGGTTAAATTTATGAAGAAAAATCATAGATACAC
AATTTAAGATAAATATTTTAAATTTTATTTTATTTTATTTGTTAAATAAATTTCTCTTCA
GGTGTCAGCTCTGAAATTTTAAATGTCCTCAGTGACTCTCTACCTCTGGCAGATGATGT
TGACCTCTCAGCATGTAGCATCAGTAACCTGACTCCTTTACTGGAGCTGATCTGAAAGCTTT
ACTTTACAATGGCCCAATTGGAGGCTTACATGGAATGTGCTCTCAGAGTGAAGTCCAGGC
AGGTTATATGAGGAAGTTGTTATGACATTTTATGAGTGATAAAGAAAGTCAATGTCAAA
ATTTTCCACTTAAAAAATGCTATTTTAAAAACAATTTGGTAAAACTGTATAGAAAACATA
AAATTTACCTTAGTTGAATGTTCCATAGTTGGAATATGGGTTTTGACAGAGAATTTATAAT
TATGAAGTTTGATGTCGTTTCTTTAAACATTACCTTAATATTGGCAAAAACATGTTGGTG
TTTGCAAGGATATTATTTAAATGGGATACCATGAATTAATACTACAAAACAAAATATAT
TAGAGTTTTTGTGTTTGTACTTTAACTTTAAAAAATAATCAGTTAAAGTTGTGTTT
TTGAAGCTCACATTGTTCCAATCTGGCCAATAGGAGCCCTTTTGTATGGCTCTCTGTATC
TTTGTAGCATGTCCTCATCATTTCTGTAATCACTTCTCACTTCCAGATACAGTAAGTTAT
TCTTGGCCAGGTGCAGTGGTTCAAGCCTGTAATCCAGCAGCTTTGGCAGGCCTAGGCAAGG
AGGATCATTTGGGCTAGTTTGAGACCAAAATCATGGTTGCACAACTGTACCCACTATGG
ACACAAGATGGGATCTTGCTCTGTGAAAAAATTTAAAAAATTAGCTGGGCACTGGGCAAC
ATACCTGTAGTCTAGCTTCTTGGGAGAGGCTGTGGCAGGAGGATCGCTTGAGTAAATCC
AGGATGTCAGTGAGCCATGCTTGTGGCCACTGCACTCCAGCATGGATGACAGAAATGAGACCC
TGCCCCCAAAAAAGAAAAATATCTTGGTTTTATCTGTACTTTCTGTATCCAGGCCCTAG
CATCAGCCTTTTCTCAAAGACAGTATTATGATTTTAATATTACAGTAGATATTGAAAC
TGTTACATATAGACTTTACCATATATTTCTAGGAAGGATTATCTATTACTCTCTCTT
ACCACATTTGTTGGAATGCTACAGAACTACAGTTTCTAAATCAGAAACTCCCTTAGT
TTTGTATATTTTGGCAAGCCATTGAAGTTCTTCCCTCTCCCTTTTACTACCAGAAAGGTGT
GTTATTGTAGAGCTCTATAATAGAAAAGCACTCTATAACATGGTTGATTCATCATTTT
GGAGTAGAAAATGATGAATGGAAGTCAGAGACATAAAAAATAAAGCCAGAGGTCTGAGT
CTTAGCTTCATTACAGACTTTCTTGGGGGATGGTTGGTAAATATCTACACATCTTATCT
TGCTCTTATAATTTAAATAGTTAAATTTTACCATTGTCCTCAAACCGTTAGAGAAATA
ATGAGCTCTTTGAAAAATGCTTCTAAGTTTTCTGTATGCTCTAAATAGAAATGCTATCTAT
GTTATTATTTATTTCTGAGACTAAAATGTTTACATCTTTAACTGGTTGTCTTTTGTG
TATTTTAGGATGGAAAGTTCCAGCTCTGTAGTAGTGAAGTCTGCTCTTCAATGGTCTTTTC
TTAACCATTACAGCTGGCTCTGACGATTCAAGCTGGAGATGGAGAAATGGCTCTTAGATCAT
CCCTGTTTTCTTATAGAGATGTCAGGATCCTTCCAGATGAATCAAAATTCATATGTACC

FIGURE 14.12

31/64

GGCTCTACTTTTGGAGCTCTTATGAATCAGAACTTGGAAATGGAACTCTTCTGATTGG
 TATCTTGTGCAGTCATCATTATACAGTTCTGAAATATAAGCTATATGTTGGGTGATAAGT
 TGCAGTGATTCTCTCCTTAACAGCGCCACATATCTTCTGGTGGTGGTGGTCTTCAGT
 AAAATAGCTCTGTGTTCTTGCTTACATAAATGGTAATTTGCATTCTCTGTTAAGATTTTC
 AAGACAGGGCTGGGAGCAAGGAACCAAGTAGCGCGTGGTGTGATTACCTTTGGTTTCT
 TTAGGAGTTTCTCTTACCTTAGTGGCTTTAAAACATCTTTAGGAGCAGTTCCATTTTATAGT
 AAACCTTAAATCTGTTTATCATGAACAGTTGAGGATAATGAATAATTTGATACATAAATGT
 AAGAATAATCTCGAAAACAAAGTGTTATCTGTGATACCTTTTGCTGCATAGTAAGCAACATG
 AAGTGATCTGATAATGTTTCAACAGGAAAGTGTTTTGATTAATGTGGGACAGTATCACTG
 TTCTACTAGCATCAACATCTCTTCTAAAAATTAATAGTGGTTCACGTAAATTTTATGG
 TACATGTAACATCTGTACATGTGTTTGGTTATCTATATGTTTCTCGGTTTTTGTACATT
 TGCTTTTATAATTTAGGCTTTTTTTTTTTTTTTTTTTTTTTTGGAGACAGTCTCACTGTATCATC
 CAGATAGATGAGCAGTGGCAAAATATGGCTCACTGCAGCCTTGACCTCCCTGGGCTTAGG
 TGAATTTCCACCTCAGCCTCTGAGTAGCTGGGACTACAGGCACATGCCACATGCCCA
 GCTAAATTTTGTATGTTTGTAGAGACGAGGTTTACCATAATGGCCAGGCTGGTCTCAA
 ACTCTGGGCTCAAGCTATCTGCGTGCTTGACCTCCAAAGTGCTAGGATTAACAGTGT
 GAGCCACTATGCGCTAGCCTAACTCAGACTTTAAAAATATAAAAGCAATTCATTTTATTC
 CCAAGAAACAGTAAGGTGGTGGTTAAATTTTAGTCTTTAAATCTGTTTTAAATTTATTCCTA
 TTTAGAAATGTCCAGAAACTTAGTATACTTTTACTTTCTGAAATGAGAAACCTGCTTC
 TTGGGACATGATGTGTGGATTTAAGCAACAAAGTTAAAAAACTACCTCTGTGTTATGAG
 CAAATTTTCACTGTAGGTGGTTCTATAACACAGGTATCAGTGAACCTTTATAAAGATGA
 ACAACTTTTCAGCTTGCTTAAATTTCACTTAATTAACATGTATATCTATCTATGTTAATGT
 TTTATGCTCTAAAAATGTTTAAATTTTATATTGTTGTAACAGATAGTTTTTCTCTCCCC
 TTCTTGCTTCCATCTTTTCACTACTACAATTTACATGCAGAGCTCAGCAATGTCTCTCTGCA
 CCAAGCTCCATGACTCAGGATTTGCTGGAGTTCTCTGGGAAAGACAGTGTGTTTTCAGAG
 CTTCCAGTGTTAAGGACAGCTTCAACAAGAGGTTGCAAGAACTTACACAGAAACAAAGA
 GATCAACTAGAGGGCAGATATCAGTATTATCAAGGCAGATACCGGAGCCAAAGTGGAGTA
 TGCTTTTTCCCCCTCATATAATGTTAAAACTTCTTAAAAATGTTTCCACCTTTTGA
 TATATATTCTTTGACTTATAAACGAGCTATATTTATAAACAGGGACGAGCAACATTA
 ACTCAGTCATGGTTATGTGCTCTCTTGCTTCAATGTTTCAATATCTTATAAGGAAGAGA
 ACGTATGGTCTCTTGAAAAAAGTGAACAATAAGAAAGTAACAACCTGGACTACCCATTTTT
 TTTACATCCTTAAATTAACCTCTCGTCAATTTCTTTTTTACTTAAGGAGGACGAATCCA
 TGAACCAACAGGACCAATCAAAACCAGACTGGCTATTAGTCAGTCACATTTAATGACTGT
 CACTTGGTCCACACAAGACCATCCATTTAGTGAAGTAGCTGGAAGAATTTTGCTGAGCTGT
 AAGTAACAGATTCTGTTTTGGAAGTACAGCTACTATTACAAGTGACATAGTATTACACTT
 AAACCTTTAAAGTTGCTGTTTAAAAATAAAATATTTTGAATATTAAAAAGCTATCTCAA
 AAATATGTGTCGTAGCTATGCATTAATAAAACCCCAAATGTGAGAAGTACAGAAGTCAAA
 ATTGAGTTTTCATTAACAGTTCATTTGATTATATTGAATTATTCATAATGAGACTATT
 TAAATTTAGTAACTTTGGGCTGGGTGCTGTGCTCATGCTGTAAATCCAGCTCTTTGGG
 AGGCCAAGGCGAGGTGGATCACCTGAGGTGAGGAGTTCGAGGCAAGCCTAACCAACAGGG
 GAACCCCATCTCTATAAAAATACAAAAATGAGCCAGGTGGTGGCATGCTGCTGTAG
 TCCAGCTACTTTGGGAGGCTGAGACAGGAGAAATGCTTGAACCCAGGAGGTGGAGGTTGC
 AGTGAGCGAGATTGCACCACTGCATCCATCCAGCTGGGCGACAGCGAGGAGCTGTGT
 CTCAAAAAATAAAAAAAAAAATTTAGTAACTTCGAAGAAATAAGGAAGGAAATTAAGAT
 TGAAGTGATTCTAATGTATAGTTTTATAAAATTTGTTATAAAAATACCTGTTTTGCTCT
 CAAAATAATTTATTAATATTTTATTGACCTCAAGAACATTTAAATACATTAGATTTTA
 TCAATTTTGGGACCATTTGTTATACATTGGATTTAAAGGATCCTTGCAATTGAGTTTA
 TGCGCACCTATGCATCTGAGACCCATGGACTGGGAACCATCTAGGTCAATGATTCAGTG
 TGATTCAAATTTAAGAGATGTTTATCTGCTGCTTTAGAAGCTGCTACCTTTTGTATCTA
 ATTTGCGACTACTTTGAAGTATGTATGTATGTGTACATACGTAGTGCTATGATTTTAT
 AAGAAGAATCAGAAAACAGAGGTAAGGAAAAATAAGGAACAAATTTCTGTTAAGCCCA
 CCACTGTCCTCAAGCATATTTGTTTATATGCTTATATGTTTTCCTATTATGTTGAAGAAC
 AGTCTGTACATATTTGCTATATAGCAGTCCCCCTTTATCCACATACATCCTGAAAAATGTT
 TTACATTTTAAATGTTAACTACTTTATGTTTTTAAATGTCATTTATAGTGTAGCTATG

FIGURE 14.13

09719554-014001

32/64

CCACAATATCCAATTTTGTAGACATTTAAATTGCTCCAGGCAATGTGGTAAATGAACATTC
 TTGCAGCTGAATATATGACACATATCTAATTGTTTCACTAGGATAGAGGTGGAAATTTGATATA
 ACAGGGAGCTCACATTTTAAAGGCTTTGAAATGATTGCGCAAATGCGCTGCCAGATAT
 ACTGCAACCATCACTAACATTTGTGTGTGAGATTTTCTTAAACTTTGGCCCTTTTGATTT
 TAGAAAAATGATATCAATAATTTACATTTCTTTGATTAAAGGTAGAGATTTATAATTTT
 CATATTATTCATTTGTCATTGTGATTTTATCTTTTCTAAGTGTCTCTTCATCCGCTTTC
 TCCGTTTCTTATTGGAGTGCAACTTTAATTGTGAAGAATTTCTTTTAATTTCTGTGACGTGG
 AATTTTTTTTCTAGTTTGTATTTCGCGTTCATTCTTAAATATAATTTGTGTTTGGCCA
 ACAATCCATTATCTTTTGTTTGTAATGGTAGTATTATACATATTAAATTTATCTTTCTTC
 TTTTTCAGATATGAAGCTTTCAAATCCAAAGAGGAGAAAAATCAAAGTGGAAACAT
 GTTTCGACCTGGACAGAAAGTAACTTTAGCATATAAATATACTTTCTTTTGATTTTGGTTCT
 TCTTAAGTTTCTTGTATGGCTTTTCCATATGTTGTACAGGAAAAAATGGTGTCTATGAAT
 TCTCTCTTAATTTAAACAATTTGGTTAATTTATAAAATCACAGATTTGGTAAATGCTATAA
 TTATGTAAATGATCAGGATTGAGATTAATCTGTAGTATAAATGGGACATTATAACAGAT
 TCCATATTTTATTTCTTAAATCTAATTTCACTCTTTAATGAATAATATTAGCCAAATG
 GTGGAACATAATTTATTTCTTTTGGAGAAAAGATAATAAGAAATGTAATTAATTTAAATTT
 TCTTGAATTTCCGAGTTGATATATTCATCACCTTTGTAGCATTTGACAAATTTTATGGCTTA
 GCAGCTTTCTCACTGTTTGAATAAATAATCTCTATTACCTAGTATACAAATATCTGTCT
 CTTTGTATATCAAAAAATGTGAATTTTACACATATTTCAAATACATTTAATTTATCTCGCTC
 AACCAGAAATGAAATCACATCCCTCTACTATACTACATCCAGCTCCAGCCCAAGATATT
 TAAATGACATCCATCTCTCTCTAGTTCCAGTTATGATTTTATCTTGATATCTCTCTCATA
 TATGAACATAATTTATAAGTTAGCCACCATCAATCAATCTCGCTATCTAATATCTTAAC
 TATATGATTAATGGGGTAAGGGAAACAGCAAAAGAGAGAACATTAATTAATATACAGATA
 AGCCTGGGCAACATAGTGAGACCCCATCTCTTAAAAAATAATAGCCATGCAATGATGGT
 GTGCCCTAGTCCAGCTACTTGGGAGGCTGAGGTAGGAGGATCACTTGCTCCAGGAGG
 TTCAGGTTCTAAAC CAGCAAGCTCAGAATCCAGGGGATAGAAAACAAAGACTTATGTGG
 ATCACTAGTATTAAACTGAGACAGCTCACCTGCAATTTGCACTTTGTTCTCAGTCTTTTG
 ATGAATCACTGAGCTGACATACCTGCGCTCTTTTACCATAAAGTGAGTTTCATGATCA
 GAAGCAATGCTCTATGGGATAGCCTTAAACAACATGTAAAAACCATTTAGTAAGTTTCATGA
 AGGGTGGTGGTGAATAATTTGGAGAACATACAAAAAATAACAATTTCCAAGGTGTGCT
 CCTCCAGGAAGGACAAATTGCTGCCTGCTCTGTGATAGAAGAGGATCAGATGTAATCAA
 CCTGCCGTGAGACTTGGGCTGTTCTCTCTGGGTGTGGACTTGCCTGGTGTGCTCACTGCT
 GCTGACAAGTAGGCTGTCAATATAGCTGGGTGTGATGTGCACTGTGGTGGGGGGAAGT
 CCACATTTGTGGAGGCCACATCCCTGCACTCTTGCCCAATTTGACCATGAATCTTAAGCAC
 TGGGGTGGCTGGAAAAAGACAGCCGATTGACATCCATACAGAGGTCATCTTGACCACTTGA
 TTAGTATAAGCACTGAAGGCTTTTAACTGAGCATTTACATAGGACACAAATATCTTGATT
 CTTTGGGCCCATTTCCAAGAACTCTGGGCATATCTTCTCCAGACCTCAATCCAGTTGT
 GTTCTTTCCAAATTTCTGCTCATCTGGTTATGTTATTAGCCACTATCTGTGAATCAGCAT
 AGATTTTTATATCAGACATCTCTACCTCTGACAGAAATGGAGGAGATATGTTACTTAACT
 ATTCGTGTTCCCTTGGAAAGATTTCTCTGTCTCCACTGTTTGAAGGGCTACTCCCTCAATGT
 AGCAGTAAATGCTTTTCACTCTGATGGGAAGTACAGGTGGAATTTGGGTCTCCAAGAAATTA
 GTGTTAGTGATACACAGTGTCTGATTAATCCCAAGAGTGTCTGGTGGCCCTTGGATCTCTGT
 GAGAAGGCTTGGAGAAAAGAAATTCATGGCAAGAACTTTGTGATGTGATGACAGGCGCT
 TTTCTCTGCTCTTCAATTTCTAGTCTGACCTAGGTGTGAGAAATTAGTGTGAGGGCCATGA
 CTATATTGTGGTGACTCAAACAGGCGCTTTGTTTACTAACTGGGAGATTTTATACATTGTA
 AGAATCAAGTAGGATCTTTGCGCATGTATTTTGGTCTTAAGAACACAAATGATGTGCTC
 CAATGACTGGAGGAACACAGGGTCCCTTGGTCTCAGCTGATTATAGATAAAACGACTGTG
 AGGCTCTGAGGCCAAGCTAAGCCATCCTCCCTGTGACTGACCTGCAGTATATCACTGATG
 GCGTGAAGATACCAAGAAATCAAAAAGCAGTAAAAATGGCCTGTCTCTGCTTAACTGA
 TGACATTTCAACCAATTTGATTTTGTCTCTGCCCATCTTAACTGAGCGATTAACTTTGTGA
 AATTCCTTCTCTGGCTCAAAACCTCCCCACTGAGCACCTTTGTGACCCCGGCCCTGCC
 CTTAAGAGAAAAACCCCTTTGATTATAATTTTCCACTACCCACCCAAATCTTATAAAAAG
 GCCCACCCCTATCTCCCTTCTGCTGACTCCTTTTTCGGAGCTCAGCCGCGCTGCACCCAGG
 TGAATAAAACAGCCTTGTGCTCACACAAAGCCTGTTTGGTGGAGCTCTTCTCACACGGAC

FIGURE 14.14

33/64

AAGCTTTAGTAGAGATCTCAAAATGGTTGGATGGTAGCAAATTTACTAAGAACTCTCAAA
 GTTCTTCAAGCCTTAGTTTTCAGCTTGCTAGAAAACCTAGTTGGATTATTGGCTAGTTTC
 CATAGTTGAGTTGGGAAATGCTTTTGAGGAGACACTTTTTCACTTTGTATTCACTGTAC
 ATTTTCTGTTTACTTGCAATCTGTCATGCTCAGGCTATTAGAGCAGGTACATTTTTATAAC
 TGGAAATGTTTATGTGTAGTGAAGCTCTGAGAGGACTTTGCATTAGATCTCAGCAGACATAA
 TCAGAAGTTGTCTCTTGTCTCAGCAATTTTTAGCTAATAGTAGCAGAAATTGCGATGGT
 AATTAGACTGCTTTGCCACAACATTAGAAAATCATTTATCTTTTATTGTCAGTTCTTGT
 CACCAAAACATACATTTTAGTACTTCTCAAATTCAGAACTCTCATAGGGCTGGGAAAT
 GCCTGTAGACACATACATACTATGAATGTGCTAATGTTTTTGTATTTTCATAGCCCATC
 AAGACTCTCGAGTCAGTTTCCACTATAATCACTCAGAGAAATCAATCTTCAAGAGTAAAGC
 TTTTGTAGAGTTACTGAAGGAAGAGTTGGGCTTAGTGGGTAAATGCCACTAAAAATTGTTG
 GATTAGTCTAAAGGTCTCTGCTACTCTTTATTGTATAGGTGTGATTATAGCTTTTGT
 CCCTTCTTAGCTGTTTTCCCCCATAAAGTGGCTGTTATTAACATCTCATCTAGAGCTGA
 AGTGGGAGGAGAAAGTGCTACTGCACATGATGTGAGGATCTTAAGTATTTTTTTTAG
 TGTAGATCTTAGGAATTTATCTTAAATGCTGATTGTATAGTGTGGAGCCATGAAGAGCT
 GAGCCGTTAGTGCAGATGGCATTGAAGAATGAGAAGGACAGAGACAGGATTTGGAATAGTA
 GAGGTTGTCGAGTGTGGTGCAAATGGGTAGAGTAGGCCGAGAGATTCTAAAATGCTCTT
 AAGTGGAGTGTAGCTGAGTAAGGGCAGTAGTGAGGATTAAACCTACTAGAAATTATCATG
 TGAGAGGAATTCGAAGATGTTTGTATAAAGAATGAGGAGGTCTAGGTTTCCCGAGGCCAA
 AGTCCATGAACATCTGATACCTCAGTGAGAGAAAGTGACAGATTGTTGTGTTTAAACCGA
 AGTCTTTAGGAAGGAATTAGAACATAGACCCCAAGGCTCGGCAAGGCTGGCAGCGGCACA
 GGCAGCAACATTGAAGGCTATTTGGTGTTCGGGATCTGAACCTGCATTTAGGCGACAG
 TGGTGTGAGTTAGTACTTTTACTTGACCCAGGTGGAGTAGAGAACTCAAGTGATGATGC
 CTTTAAGTATACCTTTTTTTAAGCCCAACATCTATATAGTCTGAAGTCGTGTTCTCTCCAA
 AGGGGTACACTGGCATTCTCTCAGCAGGGCTGGGAAAAACCAACACAAAAAAGCTCTGTA
 CACAGGCAAACTCTCTCTTTTTCACATTTAATACATTTGTAATAAATATCTAA
 AGTTTAGCAACAGTTGCTGTGTATCAGTGGCTGAGCATTTTGTATGCTTTATTTCATTC
 AGTTCACTCTATGAGGTGGATCTACTATCCCACTTTCTAGATGAGAATTTGAGGCAC
 AGCGAGGTTAATTAAGTGTGCAAGATCACATAGCCAACAGTCATGGAGTGAGGCAGTCT
 CTATGCCAGAGCTTAAGCTTAGAGCATAGTTCTCTGGCTCTACAGCTTTAGCAAGTGACTG
 GCTATGCTGACGAGGACCAACCTCTCTAATGTCTCATCTGTAAATAGGAATTTGAATAG
 TTACTAGCTCAGTGGGTCAAATGAATCATATGTGTTAGCACTTTAGCAGAGTAAGCACT
 CAATGAATAGTAGGAGTTATCACATCTTCGTATTTGTGCATTACCTTCACAGTTTACAGA
 TTAAGGCCAGAAGCAACTTGTGTAGCTACGGGTTTAGTGTAACACAGTTTCCATGTGTG
 TCTCCATGGAAGGGTGTGTGGGACCTGTTATTGTGACTGTCTGTACTTTTCGTATTGTGTG
 CTGCGACCCATGTTTATTAATGATAAGGACAATAATGCAACAAAGTAGTCAGCAATGT
 TGCAAAATGCCAGTATTGTAGTGGCTATCACAGCAGTGGCACTGGCAGGCAGCACCATGG
 TGGAAGTTCAAGAGGTCACTGGCAGCCACTGAGCTAGAGCCAGATCAGGCATGCAAGA
 GGAGCCTGAGTGGGAGCCACTGGGAGTACGGGCCAGAGTGTGACCAACCAAGTACACCA
 ATGGCTGAGTGGCTCCCTGGAGCATGGCAGTGGCAGAACAACTCCATGAATCAGATCTG
 GTGTGCTCTAAACTAGTGTGTTCTGCTGTGGACCCCTTTCTCTACCAAGAACTTCA
 ATCCTCTCAGCAAAATGAGGAGACTACTCAGATCAGTGACTTAGTCTGTTTGGTGTATATA
 TATGTGTACACAAACAGCACATATTAATAAATACCTACTATGTGCCAGGCACCTGCCTAC
 CACTGGAATCTTTCATAAGACATTTGTTTTACTTTTGCATTTCTGCTTTACACTATGAA
 ATAGATGTTTTGGATTATATTTCTCAGCATACATTTGAATATGCTGTGTTATGCATATA
 GTAGGCTATGATAAGCAAGTATTCTCATTTAGAATTTGGGAATTTGATTATACATGTG
 GACAAACCAACCAATAATGCAAACTTTTATATGATAAATACTTTGGAGTGTGGCTGG
 GAGGAAGGCAGCTATTGTAGGGTAGGAACTAGCAAGTAGCGGACTAGCGGCTGCATAG
 ACCAGACCCATCCGTAGTGATCCAGATGAACAGCCACCTCAGACACTTGGATAAAGGG
 TCCACAGGAAAAAATCTCTGGCCTATCAGGTGCTATGTTACAGTTTCAGTTGGAAGT
 ATTTCTCAAAAGTTTTTATGTTGAGGTACACATCTCTACAGCTTTTACTGCTGCCA

FIGURE 15.1

34/64

AGTCCCTGTTTCAAGGGAAGCAGCAATGAATTACACTGTTCCCGTAGTCAAGGACAGTAT
 ATCTTACCAGAACTATATCCCACTTAAGGAGGTGCTGGATGTCTATAAGATTGGATCAA
 CCATTATGGGTGTTCAGAGGAGAGATTATTTCCAGCTCAAGACCCAGGGAAGGAGCATA
 GGATGGATACCCAGAGTCATAGGGAGGATTAAACACAGGACATGTACACATTAGTTAGTTG
 GGTATAAAGTGGAAACAGAAATGAATGAGACA CAAAGCCTTGAATGCCAGAAATACTAGTA
 GTCCTGTGTGGGAAGGATATAAACTCAACTGGGAGTGGAAAGAGAAAGGCAGCATGAGT
 CTAGGAGAGTGTACAGTAGGTTGAGGTAACATATCCTGAAGACTATAATCCAAAGATTAT
 TTTTGGTTTGAATTTGTTTGGTTTGAATTCATGGTATCTATTTCTTTGGATGGATGGT
 TGGGGAGGGTGGCATGTAGAATGCATTTCTTACCAATCAGCATGATTTTCAAGACAGTAC
 AGAGAAAAGACTGCTGAGCTGATGTAGGAGCTTTGGCTGCAGCTCTTATGSCCTTTCAGCA
 AGCGGTTTAACTCTACTACTGCTTCATGACTGTGGCTAACAAAGTAGGGATAGTCCGGAG
 CACAGAGGATTTTtagggcggtgaaactatttaactctctttgtatgatactataatgg
 TGGGTACATGTCATTATACATTGCCAACCCCAAGAAATACACAGCACCAGATGGAAC
 CCTAATGTGAACCTGGTCTTTGATGATGCTATGTCAAGTACGTTTCATCCGTGTAACAA
 GTGTACCATTCTAGTGGTGGAGGGGTTATTGATAAATAGGGGAGGATGTGCATGTGTGGG
 GGCAGGAAGTATATGGGAAATCTCTCTACTTCTGCTCAATTTTGTCTGTAACCTAAAAACC
 TCTGTAAAAAATAAAGTCTATTTTTTAAAAAGTGGGGATGGTATTACGGCAATATAAAAT
 CAAAAATGTTTATGAACAAATCTTTTCTCCAGATGAAACTGTATATATGACACCTCGT
 ATGTGTATGTATAATTTTCATTCAAACGTGAAACAACTTTAGAATTTGGCACCAGCAATAT
 AAACACTGATACATTAGACTATCTCGAACACCTTTTACTGACCCTTTGAAACCTTGCTT
 ACCTATTAAGGTTTCATTCATAGCTGTGATGTTCTATTTTTATTTTCAAAGTGGGATTATC
 TTCTGTTTCCCCCAGGGAGTATATTACCAAAATGGTGATGTTGTTTCTGTGATGTATGA
 CAGAGTTGGAAAGCCCTACTATGCTCAAATCAGAGTTTATCCAGGACCAGATTGTGGAG
 AAGAGTGCAGCACTGACCTGGCTCATTCCTACCCCTCTCTAGCCCCAGAGGCCAATTTGAT
 CCGGCTCTCTATATCATAGGTAAAGTTTGACAAATGGCACAGGTTTTTTTTAACTTAGTT
 AACTCTCCAATATTATGTAAAGAGTGTGTTAGTCAGCTTGGGCTGTCAAGCAAAAATAT
 CACAGACTGAGTGGCTTAAACACAGAAAGTCACTTTCTCACAGTTGTGGAGGCTGAAGT
 CCAACATCAAGGTGCTGGCAACACGGATTTCCTGGGAGGCTTTTCTCTGGCATATAGA
 TGCTGACCTTCTTGCTGTGCTCTCATGGGCTTCATGGAGTGAGAGCTCTTTGGTGTA
 TCTTCTTATAAGGACACCATTTCTGTGATGAGGGCCCCACCTCTATGGTTTCAATTTAA
 CCTTAATGGCTCCCTAAAGTCTCATCTCCAAGTACCATCACATGGGGATTAGGGCTT
 CCAACTATAAATTTGGAGGGTGGCGGGGGGGATGCCAATTCAGTCCATAACAAAAAAGC
 ATGAGTATTATTAAGTACAAAAAATTAGAGAGCTTTATAGAAAAATATGAGGCATTTTAT
 GTAGCTGGAGTGTGAGTGCTATCAGTTATTTTGTAGTTAGAGCAATGTGCATCTACTAAGA
 AGTGGTATGGATAAGATTTTTTGGAGTGACCCAGGGTTAACTGTACTACAAGAAATGTA
 TTGCTCAGGAACTAGGTTATTTAGGTTACTTATTTATACAAACCTATTCAAAAAATATTT
 AGGAAAGAACTATCCAGTTATCCCACTCTGCAAAATCTCAATATGTGTGCTCTGCAT
 GCTACACATGTCATCTTAGGCTTTATAGTATAAAGSGCTGATAGTTGAAATGGCAGCTGC
 TGTGCTTTTGTATTTTCAAAGCTGCCAAAACAGTTGTGAGATAGACTCACAGAATTTTA
 CTGATTTTATACAATTTTTTAAAGTTTTCAGATTTTATCAGTTTACTTCAGACTTTTATCTT
 TCTGAGTGAGCATGTCATCTTCTGATCTCTGAGAACAAGCATAAGTGTGTTTTTG
 GAGAGAACTCCAGGGAACAATAATATACCACTGTTATTCTCACCTATATGTCAAGTTTGA
 TACATTACCAAACTATCTAGCCTTCTGCTTATAAGTATATAGAAATTTTTATTACCTTA
 TCTATGATCAGGATCTCAGCAGAGGCGAGTGATGTATCAGAATCACCTTCGGATTTCTC
 TACTGCTGCTCTTTTCTAATCCCCAGATTCTGATATGCATCTTGTGCTACAGCGAGGCA
 CGATGGCTGAGGTCAGAACACCAAGTTCTGGAGGCCAGACTGTCTAGGTTCCAGAGCCTGCC
 ATTTACCGGCCATGTGACTTTGGCAAGTTTCTTAGTCTCTCTTGCTCACTTTCTCTCATTA
 TGTAAATGGGAATAATAATAGTGCCTACCTCAGAAGGTTGATGTGAGGAATGAAGGTAT
 TGATACATGTAAACTTAGAGCAGTGTGGGTACAAAAATAACATGATGCAAGTTTCTCAATC
 ACTGTTTTTGGGAGAATGCCATATTCTTTAAGCCGTTAAAGAAGAAAAAATGATTAGAA
 TAATTTCAAAGTAATGCATGTTTCAAGGGCTAATGCCAGGTTGCTCCAGAGTGGTCTCT
 CCGGCTGTCTAGAAATTTTAACTCTTATGAAAAATGATATATATGTCAAAAATGATTTT

FIGURE 15.2

35/64

AACCTTTCCCTTGGCTGCTTCCAGGGCCAGGGAAGATCTTCCAAGGAAGATGGAAATAC
 TTGGATTTTGTTCATGCACCTTCTGAGTATTTCAAGTCACGGCTCATCACCATTTCGCC
 ACAGCTTCCACCCAGGACCGAGAGAAGGGCTACATATGGAATCTGTTGGGCTCATCTGTCGA
 ATACCAATTAAGGAATCAGTTGCCAACCACTTTGTAGTTTACAAATTAATACTGGGTTTCC
 AGGCTCTGCTGTTGGTGGCTCAGGCTGTAGCCCCAGCTATTGCCACCTGCTCTCCAAGT
 GGGCAATGGAGTCAGATTCTCTTTCTTAAAAAACCAAAAAAATGGATTTCCTCAGTTCT
 CTAATATTTCTTAGTACCACAAGATATGTCTAGGTATCTTTAAATGAAATCTTAGCTGG
 AAAAGTGACTAAAAAGTTTTCCTCTGCTACCTAGTAATAAACCAATCATGTTTATTAC
 TGGTCACTTTAGAAAATTAAGGAGTAGGGCCAGGCAAGTGGCTTATGCTGTATATTCG
 AGCACTTTTAGAGGCCAGGCGAGGCGGATCACCTGAGGTCGGGAAGTGGATCGCTGAGG
 TCAGGAGTTTCGAGACCAGCCTGGCCACATGGCGAAACCCGCTGCTACTAAAAATACAA
 AAGATTAGCCAGGTGTGGTGGCATGTGCCTGTAAATCCAGCTATTGGGAGGCTGAGGCGAG
 AGAATCGCCTAAACCCAGGAGGTGGAGGTTGTAGTGAGCGAAGATTGCACGCTGTGCT
 CCAAGCTGGGCAACAGAGTGAGACTTGTCTCGGAAAAAAGGCTGGT
 GGCACAGTGGCTCACGCTTTAATCCAGCACTTTGGGAGGCTGAGGCAGATGGCTCGCC
 TGAGGTTGGGAGTTTCGAGACCAGCCTGGCCAGCATGGTGAACCCGTCTCTACTAAAAA
 TACAAAAATTAGCCAGGTGTGGTGGCGCACACCTGTAGTCCAGCTACTCGGGAGGCTGA
 GCGAGGAGAAATGGTTGAACCCAGGAGGCGGAGGTTGCAATGAGCAGAGATCGTGCCACT
 GCACTCCAGCTGGGTGGACAGAGCAAGACTCCGCTCTCAAGAAACAAACAAAAATTA
 AAGGATAGATAATAATGAAATATATTTTGAACCTAAATTTATTTCTATATGTGTACTT
 CCTAGGCAAAAGCTGTAAATTTCCAGAGAGACCATTAGGAACAGGTAGTATCTATTTTCT
 CCATTTATTTATTTCTAGAACTCATAAAAATGGATTGTATTTTCTATAAGAACAAAAAT
 TATTAAGGTATAGATGACTGACCAAGGGCTTAAATCAATAAAAATGACTAACAGCATCTA
 TCAATAAGGCCACACAAGCCTTATGTTCTCATCTCAAAATGCTGTGACAGCTTTTGGCT
 GCTTTTAAACATAAGAAAAATGATTGGTGGATGATTTTATTAGCCAGGCTTTTAAACACT
 TTCATCTAGGCCACGTCGCGTGGCTCATGCTGTAAATCCCGGCACTTTGGGAGGCTGAG
 TGGATGATCACTTGAGGTCAGGAGTTCAGGACGAGCTGCGCCACATGATGAACCCCTG
 TCTCTACTAAATATACAAAAATTAGTTGGGTGTTATGGTGCATGCCGTAAATCCAGCTA
 CTCGGGAGGCTGAGGCGAGGAATGCTTGAACCTCGGAGGTGGAGATTGCAGTAAGCCG
 AGATCGTGCCACTGCCTCCAGCCTGGGTGATAGAGCAAGACTGTCTCAAAAAAGAAAAA
 AAGAAAAAATTTTAAATTAATCTCTGTAGAAACAGGCATTCAGAACCAATCCATGGA
 TCTTAAATAAGCTGCTCTTTACTGTTTCTAGTCAAAAAATGAGACTTCGATCAAAACATAA
 GATTTTATACTGCAGATAGTCAGCTTCAACAAAGCCGAGAGGAAACATGTCGAGATCAG
 GCTTCTCTGCTGTAGATGCTCTTGAATCACTTAAACCAATATTGGGAGGTCATGAAGT
 CATTTGGTAGGCCATTAGCATTGATATCTTTAAACATCTACCTTAAACCATCTGCTATGG
 ACCATAATAAGAGGCTGTTGTATATGAAATTTGCTAGAAATTCAGGTGCGAGGCTTTTGC
 CGGTTAAGTAAGGGAGCAACACGTAATAATGGGAGAGGAGTGGGCTACTCACTTGCCTC
 CTCTTTTGTCTGATTTTACCAAGCATTTTCAACCTTGGGAAAAATTTGCAGAACTTAACT
 TGATTTGTAATGATTTTGAAGTGCAGCAGCTTTAACTCTTACCCCTTTTCCACATGTTAT
 GGTGTTTGAAGTTGGAAAGAAACCACTATAGGTAGCTACAGCATATAATTTATCTTTAT
 TCACAAAGGGTATAGTAAAAATGATTTGTAATAACTTCTAAGTGCCCAATATTCCAAACT
 TTTGTAATTAATGATTTTTCACCGTGCACTTTACTTTGGAATGATTTTATTTTCATTAA
 CAATTTAAATGGGCTCTTTTACCAAAATGATTTTAAACCAAAACAGTATCGTATCT
 AGAATTTGGAGTAGAGCCGCGGCAAGTGGCTCACGCTGTAAATCCAGCACTTTGGAAG
 GCTGAGGCGAGGCGATCACCTGAGGTGAGGTTGAGACCAAGCCTGGTCAACATGAAC
 CCGCTCTCTATAAAATACAAAAATTAGCTGGGCGTGGTGGCGTGGCGCTATATATCCCA
 GCTAGTCTCTCGGAGGCTGAGGCGAGAGATCGCTGGAATCTCAGGAGGCGAGAGCTGC
 AGTGAGGCGAGATCGCGCACTGCACTCCAGTCTGGGTGACGGCATGACTCCATCTCCAA
 AAAAAAAGAAAAAGATTTTGGAGTAGATTTCATCATTAAATGAACAGATTTTGGGAA
 ATCAAAAAATGGCTAATAAATGAACACATATGAACATTTTATAAATGTAGACTTTT
 AAAAAATCTATAATGATCATCTGTTTATAAATGGCAGATGGTTGTGATCACTCTTTTA
 AATAAAGATTGAATTTACCCAGTGTGATGGTTCCCATTTCTATATTTCTCTGCTGTA

FIGURE 15.3

36/64

GGGCGGACCTGATATGGCCCTGGTCTGTGTTCCCGAGCCTTGTTCCTCATTACCACTAA
 ATCTTTCCCTGATATGCCCGCCCAATTTTCTGGCTCTGAGTCCTTGTTCATCTCTTCT
 CTCCAATTCCTACCTTCCAAAGGCCATTTCTTAACACCTTCGGATTCCTTCTTGGAGACT
 TCCGACATCCCATGCTCTTTTGGAAATCAATCTCTATCTCTATTGTCTATCACAATTAAGTTT
 CTACTTCATCATCTCTCACTCTATCCCTTTGGTGCTGGGATGACAGGGATGCTGTGTTT
 TATTTATCTATCTTTTGTAACTTCCACATAACCTTAACCCCGGTCTTGTGCTTATGGGAGATG
 CTGATTTGAGGGTCTGAGTTAGATCTGTTAACTAAATGCTTGTGTATTTTGTAGTTAT
 TAATTCATATTAACCTTTGGCTGAACTTTTAAATCTTATTTGGAATAGTCAAGTAAATTT
 TAGATTTGTATCTCTGGGTGTAGTATTAGATTGTTTGTAGATTGTTTAAAGCAAGATGT
 TTTTAAAGATGAGTTTAAATAGTTCTCTTAACACCAATAAAGCTTAATATGAGTATTTGA
 AGGAAATATCCCAAAACATTCCAGTTCCTGGCTGTGAAAGGCTTTTCCAGGCCATAAA
 GTTTTCCACTTCAGCCGTAAAGTAGGTGAATCAAAATGAACAATAGAGGGAATGTATTTA
 TTTGCTTTTATACATGTCATGTGTGTGTGTCTACATATAAAACATTGCACACGCTTAGAA
 TGAAGTTTCTGTCTATGCCAGAAAAGGAGAGGCACTTTTGTGGATTTTGTCTGGCTGCC
 CTGGGATGTTTGAAGAACTGTGCTGTTTACTTCTATACCGAGTGTGTGAGCCATACCTTT
 GGTAGGAGGTTATACCTCCTACACCAAGAAATATAAGCCAGGAGAAGGTCTGTGCCAAG
 AGAAGGAACCCAAATGACCCACAAGAGGTGGGCCATTAAATATTGGGTCTAGATGCAATAA
 TGCACAGTAATTTTATTAAACACCTCTTAATGTGTGACCCACAAGGAAGATTGCTGCTAGT
 AGCCGAAGAGGTTTCACAATAAATAAGAGAAAAAGCAGAAATGTAGAATCTGTATGATAGCAA
 TTCTGCAAAACGAAGCATCTTTTATAAAGATGGAAGGAGCCACAGGCACAGTAGCTCAT
 GCCTGTATCCAGCACTTTAAGAGGCTGAGGTGGAGGATCACTTGTAGCTCAGTGACCC
 ATGATTTGGCCACCACTCCAGCCTGGGTGATAGAAGTGAGACCTTCTCTCAAAAAA
 AAAAAAAGACGGAATTTCTCCAGAATTTTAACTGTCAACAGAGGTTTCTGTC
 AGCTCTCTTTTTCAGCTTTTATCTTCGCAGTATTTTCCAAATTTTCTCTAACAGCAGTA
 TTTTCCAAATTTTACAAATAAGCACACACACACACACAGTTTGTTCATACAGTGCCC
 AACTGGTGGTGAACAAACGCTGGCTTTTAGTCTATACATATCTAGAATATTTTATAAATA
 GTAGTTCTTAAACCTTGAAGGGAGTGAATGACCAGCTGAGAAAATAAGTCAAGTATT
 TCATTATTTCTTATATTCATCATGATTTCTAGGAAAGAACTTGGGAGTGACTCTCTTC
 AGCTTCAGCCACTCTCTGGGCCAGGCGCATGCTTAGCTCTGTGGTAAAGGTCAACAGCTTC
 TTCTGCGAGGTCCTGTATCATCTGAATTTGGAGGTTTGGCGAGGTAAGAGATGCTGATGA
 GGTTCAGGTTTTCTTTCTGTCTCTCACTTGAATCTGTCTTCCCTTCCAGAGTGCCTG
 CGCTGCTGACTTAAAGGCCCAACACCAACAACAAGAACCAACAGCTTACACAGAGTGTTC
 AGCAAGCTCCACAAATTTGTGAAGGTAAAGTTCTCTTATAGATTCCTTTCTATATCGC
 TCCTAGTGGTCTGTTTTCTGTATCGAATCTGGCTGATACAGTTGCTGAGACTCTGAA
 AGAGAGGCAAGGAACCTACTGTTTCTCATATAAACTGTTTGAATTTTGGCCATCTT
 TTTGCTGTGAATATGTAGTGCTTTGATACATTTTTTAAATCAAAAGTAATGAAGAGAT
 CACATAGGGAAGATAGATTGGATTATTTTAAAGTTTATATACTAAATTGAAAGCAAA
 GAATAAATGGGAGAAACAGCTCCCTCATGTGGCTGTTGGCAGGAAGCTTCCATCTCTCT
 CTGTGGGCCCTCCACAGGTTTGTCTCACAGCAAAATGGTCCGTGACAGAAAGACGAAGGCA
 GTTGCAACCAAGATGGAAGCCACCATCTTTTCTATAACCTAATCTGAAAGAAAGGACATA
 CCAGCACTTCTGCCATATGCTGTGGGTACACAGACCAACTCTGTGACAGTGTGAACAC
 AGGACCAACAAGGGCGTGAATTTCAAGGGCAGAGACCACTAGGGACCACTCAGAGGCA
 CAGAGGGACACCCATATCCAGCTGGTGGCCAAATGTAATTAACATAGCTTTTGAATAGC
 AATATGATCTATAATCTTAAAGTATTAAAGTACTTCTGTATCCAGTAATTTTATCTT
 TAAGAAATCCATGCTAAGAGGATTAAATATGTGGACCAAAATAGGGTATATAAAGAAAGTT
 GTTAAACAGTATTTAAAGTTGTGAAAACCGAAGCAATCTAAAGGTCACCAATAGGAAA
 ATGAATTTTGTATATTTTCTAAATAGAATTTTATGCTGTCATCAGAAATACCTTTACAAA
 TAATTTTAAATACGCAAAAAAAGTTTATAAAATGTTTGTAGTGAACCTGACACACAC
 TACATTAATGATTCTGATTTTGTAAAAAAGAAAAAACAACACACATATACACATGAT
 TACATATGATATAAAGAAACCTGGAACAAACAAATAACCAAGCATAGTTGGATATCAG
 TCAATTTAATTTCTTTATGCTTTTAAAAATTTTGAAGTTTGTATTACTAGTACCTACCA
 CTTACGTAGTCAGGAAAAAATAACACTTTAAATAGATATTTAGTCCAAAGATGGTAA

FIGURE 15.4

37/64

TCTAAATGGTGTACAGGCTGAATGTGTGCTGATCCCCATGCCCAAGTTCATATGTTA
 AAGCCCTGGCCCCCAAGGCAATGGTATTAGGGGAGTAGGGCCCTTTGGGAGGTAATCAGAT
 TCTACAGAGGTCATGAGGGTGGAGCCGCATAGTGGAAATTAGTGTCTTTTAGGAAGAGG
 AGAACAGACCAAAGCCTTCTTTCTCTCTCACTATGTAAAGAACAGCAGCAGAAGGTGGC
 CACAGCCAGGAAGAGAGCTCTCCACAGAACCCAAATCTGCTAGCACCTTGCTCTGGGTT
 CTCAGCATCCAGAACTGTGAGAAATGAATGTGTGTTTAAACCACTCAGGCTACGGTA
 TTTTGTGTGACAGCCCAAGCTGACAGAGATAGAAACAACACAGGAGCCCATCAGCAGAC
 GAATGGATGATCAAAACGCTGGTGAGGTCGTGCAGTGGGATATTAATTCAGCCGTGAAGGA
 ATGAATTTCTGATACATGCTATAATGATGAACCTTGAAACATGTTAATGGAATAAGCC
 AAACCTTAAAGGACAAATATTGTATAATCCACTTATATAGTTAGTTACCTAGAAATAGG
 CAATTTATGT CATAGATACAGAACATTAGAGGTTACCGGCTGTGGGAAGAGGGGTATT
 GTGGGTACAAATTTTCGGTTTGGAGTGATTTTGAAAAAATCTTGAAATGGGTAGTGACA
 GTAGTCAGATGATGAATGTACTTAAAGACACTAATTTGACACTTAAAAATGGTTAATA
 CTGGGCTGGCGCAGTGGCTCATGGCTGTAATCCCAAGAACTTTGGGAGGCCAAGACAGGC
 GGATCATGAGGTGAGGAGATTGAGACCATTCTGGCTAACATGGTGAACCCCTGTCTCTAC
 TAAAAAATAAAAAACAAATAAAAAAATAATAGCCGGGATGGTGGCAGGCACCTGTAGTC
 CCAGCTACTCGGGAGGCTGAGGCGAGGAGAAATGGTGTGACCTGGGAGTCGGAGCTTGCAT
 GAGCTGAGATCGGCCACTGCCTCCAGCCTGGGCAACAGAGCCAGATTCGGTCTCAAAA
 AAAAAAAGAGGTTGATACCTGGGTGGGTGGCTCATGCTGTAATTTACAGCACTTT
 GGGAGGCCAAGGCAGGCAGATCAGTTGAGGTCAGAGTTAAGGACAGCCTGGGCCAACTG
 GGCAGAACCCCATCTCTATTAAAAATACAAAAATTAGTCAGTGTGGTGGTGGTGGCTG
 TAGTCCCACTGCTGGGAGGATGAGGCCATAGGAATTTGCTTGAACCCAGGAGGCAGAGTT
 GCAGTTGATGTGAGATTGCGCCACTGCCTCCAGCCTGGGGGACAGAGCGAGATCTAGTCT
 CAAAAAAGAGGTTAAATTTGTAAGTTTGTATGATATTTTACCATAATCTTTAAAAA
 TAGATATATAGGAGATAAAGTCAACAGAAATTTAATACCAGTTGTAAATAGAGACTGAGT
 GAGGAGATGAATTAAGGAAGACATTGAGTACAACCTTTTGGTAGTGAAAACTCTTAA
 AAAAAATACGTGGGCAAGAGCTCACTTGATTCTTATAATTTAAAAATCTCCCAGTTAGTA
 AACAGGCTAGGTGGAGATTGCAATGTGATGTGAGTGTGTGTTCTGTGTTGTAATGTGA
 GGACTGTGAGCCATCTCTGGACTTGAATATCCATTAGATAATTGAAAAACGGATTTGA
 GAATCAGGAGACGTGCAATGCAGTAACAAAACTCTGCACCTAGTTGATTTCTGTCTCCT
 AATTTAATGCTTTTATGGGCAAACTGTTAGGCAGGTGGGCAAGATGGACAGCCATATTT
 TTTGGGATTTCTGGCCTGTGGGCCAGCCTCAGTGTCTCACTGAGGTCACTGCAAACTT
 AGAACACATTCAGGCCTACCACAGTCAAGGCTCCCTTTCTCAACTCTAGTCTCTGACAC
 AATATCCGAAGCCTAGAAATAATATCATCTGTCTCTGTGCTTGCATTATGAAGAGCCTA
 GGAAGAGGCCCTTGGGAATTAAGAAGAAATGGAAAACTGGTCTAACTGCTGCATGCTCAG
 CTTGCAGGGGAATCACTGAAATGGGACAGGCCATAAAGGACAACAGGAAGAGTGGCTT
 CAGCAAGGCGATCGTTTTCAGAGCAAGCTAGAGAACTCCTGCCAGCTCCTCAGGCAGGG
 CCCCTGGGCACAGAGGTTAGGCAAGGGAGTGTCCAGCATGTTGATGCCCTGAGCATCAG
 AATAATGCCATAGAGGAGCTTCCAAAGAGTTCAATTTCAAGTTTGTAAAGCCGAACATTTT
 TAAGCAATAAATTTGATTTTGTGAATAAGAGCTTGTTTCTTCAACTCCAGTGAGATTC
 CATAGATTTGATAGTGGCTGTGATCCAGATAAAGAAAAACAATTTTCAAGATTCTATAT
 TCTTTGTAGATGTACGGATTAGAGACATCTAATCTAATCTCCTCATCTACAGATAGG
 AAAAATGAGGCCATAAGAAAGTTAAGAAAAATACCATGGAATGTCACTGCTGAACTGCCAT
 ACGTAGGATCCGAAGAAATTTGGTAAATGCTACTGTGAGAAATACAGTACTAGTGTCCAA
 AGAATCTAATAACAAATTAATAATCTAATGTATTCTTAAAGCATCCCTGCATGGCTG
 AACTTACATAGTTTCACTTTCTTTCTTTCTGTGTAAGAAAGAGGCAATTTGGCTGGGTGCA
 GTGGCTCATGCCCTGTAACTCTGGCACTTTGAGAGGCCGAGGCGGGTGGATCACTCGAGGT
 CAGGAGTTTGAGACAGCCTGGCCAACTGTGTAAGCCCATCTCTCAATAAATAACAAA
 AATTAGCTGGCTGGTGGCGCTGCTGTAATCCCACTACTCTCAGAGCTGAGGCAGG
 AGAATTACTTGAATCTGGAGGTGGAGGTTGAGTGAGCCAAGATCAGCCATTGCACTC
 TAGCCTGGATGACAAGAGGGAACTCCATCTCAAAAAAAGAAAAAGCAATCACT
 AACCTGTGTGTTTATTAAACATGACAGACTGGCATGAAGTAATACCAAACTGTAAACA

FIGURE 15.5

38/64

AAAAAGCTACAATCTGCCAGGCATGGTGGCTCATGCGCTGTAATCCCCCACCTTGGGAGGC
CAGGTTGGGGGATCACCTGAGGCCTGGAGTTCAAGACTAGCGCTGGTCAACATGGTGAAAC
CTCGTCTCTACTAAAAATACAAAAATTAGCCGCGTGGTGGCACAATCCCTGTAATCCCA
GTTACTCAGGAGGCTGAGGCAGGAGAATCACTTGAACCTGGGCAGTGGGGAGGTTCAGT
GAGCCAAAGATCGCACCGTTGTACTCCAGTCTGGGCCGACAGAGTGAGACTCGGTCTCAA
AAAAAGAAAAAAGAAAAAGCTACAACCTTAATCTCAACTTCTCATAACATCATCTCTACTT
CTGATTAGAAAGATGGAAGTGGGGAGGTTTATTACAAAAGACTGTTATACCTTACACAC
TTCCTCCCATGAATAGTGAAGGTGTGAGTGAAAAAGACAGCAATTTTATTTTTTTTTGA
AACAGGTTCTTGCACTGTCAACCCGGCTGGAGTGCAGTGTGTGATCACTGTCTCACTGCA
GCCTCCACCTCCCAGGCTCAAGTGATCCTCCTACCTCAGCCTCCTGAGTAGCTGGGACCA
CAGTTGTGCACTACCATGCCAGCTATTTTTTTTAAAGAGATGGGGTCTCACTATATTGC
TTAGGCTAGTTCTCAAACCTCCTGGCCTCAAGCAGTCTCTCGACCTTGGCCTCCCAAAGGG
TTGTGATTACAGGCATAAGCCACCACCCAGCCAGCAGTTTTAGAATAAAGGGTGAAGG
TGCTGTGGGGAATATAATTTAAAAAACAAAATCTTCTCAACCCAGAAATCTCTCC
ATGAAGSCAGTAGAGAAAGATAAGCTTTATTATTGAATAAAAAATTAAATGAGAATGTSAT
GCACATCACAGGCACCTTTGCTAAGAGATCACAAAGACAGAAAGGAAATTCACCATTTTGT
ACAGCCAAAGCAGGTACAGCCCATTAAGTGTATGTTTTCGAGATAAATAGTCTCAACTAA
GAGAAGTTGACAGCACCCTGGTCAACAGTTTCACTTCTAACCTTACCTGATAATTGATGT
GACCACTTGTGTTTCTAAGATATCAACTTTTCGGGGGTGGGGAGTGTGGAACAGGAG
TTACTTTTATAGCTTGGTGCAAGGTACTCATTAAAGATTAGGCTGTTACCTCCCCACAGAA
ACTGGAAGATAGGTATGCTATCTGGTAATGTTTACATTCCAGATCTTGTGAGAAAGACA
TTCTTAGGTATATAAGCTGACAAAAGGCTGATTCAGTTTTTAAATATATATATCTGTATA
TGATTTC

FIGURE 15.6

09719554-011604

39/64

actgagagacaggactagctggatttcctaggctgactaagaatccctaagccttagctgg
|||||
actgagagacaggactagctggatttcccaggccgactaagaatccctaagccttagctgg
|||||
g-aaggtgaccacatccaccttttaaacacggggttgcaacttagctcacacctgaccaa
|||||
ggaaggtgaccacacccctccttttaaacacagagcttgtaactagctcacaccggaccaa
|||||
tcag-----agagctcactaaaatgctaattagtc-aaagacaggaggtaaagaaa
|||||
tcaggtagtaaaagagctcactaaaataccaattaggctaaaaacaggaggtaaagaaa
|||||
tagccaa-tcatctattgcctgagagcacacagcaggagggaacaatgatcgggataataaac
|||||
taatcaaatcatctatcgctgagagcacacggggagggaacaatgatcgggataataaac
|||||
caagttctcgagccggcaacggcaacccctttgggtccctccctttgtagggagctc
|||||
caggcatcttgagccagatcaggtaacccctctttgggtccctccactgtagggagctc
|||||
tggtttcatgctatttcactctataaatcttgcaactgcac--tcttctgggtccatgtt
|||||
tggt-----ttcactctataaaatcttgcaactgcacactctctgggtccatgtt
|||||
tcttacggcttgagctgagctttcgctcgccatccaccactgctgtttgcccacacgca
|||||
tggtccggctcaagctgagcttttgctcgccgtccaccactgctgtaatgcgcctatgca
|||||
gacccgccgtgactcccatccctcctggatcatgcagggtgtcgctgtgctcctgatcc
|||||
gacctgcccttgactccacccctccggatccggcagagtgctcgctgcactcctgatcc
|||||
agcgaggcaccattgccgctcccaatcgggctaaaggcttgccattgttctctgcatggc
|||||
agcgaggcaccattgccactcccgatcaggctaaaggcttgccattgttctctgcatggc
|||||
taagtgcctgggttcattcctaattgagctgaacactagtcactgggttccatggttctct
|||||
taagtgcctgggttcattcctaattcaggctgaacactgggttcctccacggttctct
|||||
tctgtgacccacagcttcttaatagagctataaacactcaccgcatggcccaagggtccatt
|||||
tccatgactccacagcttcttaatagagctataaacactcaccacatggcccaagggtccatt
|||||
ccctt-gaatccataaggccaagaacccaggctcagagaacacagaggttgccaccatctt
|||||
cgttggaatccatgaggccaagaacccaggctcagagaataaaaggcccgcc-ccatctt
|||||
gggag
|||||
gggag

FIGURE 16

40/64

TCTGTGAAC CTCTAGAGGA TTTGCGCCTG CTCTTCAAAC AACACCCAGS AGGAAAGTAA 7860
 CTAAATCAT AAATCCCCAT GGGCCTCCT TATCATATIT TTCTCTTAC TGTCTTTTA 7920
 CCTCTTTCA CTCTACTGC ACCCCCTCCA TGCCGCTGTA TGACCACTAG CTCCCTTTAC 7980
 CAAGAGTTT TATGGAGAAAT GCAGCGTCCC GGAAATATTG ATGCCCCATC GTATAGGAGT 8040
 CTTTCTAAGG GAACCCCCAC CTTCACTGCC CACACCCATA TGCCCCGCAA CTGCTATCAC 8100
 TCTGCCACTC TTTGCATGCA TGCAAACTACT CATTATTGGA CAGGAAAAAT GATTAACTCT 8160
 AGTTGTCTCG GAGGACTTGG AGTCACTGTC TGTGGACTT ACTTCACCCA AACTGGTATG 8220
 TCTGATGGGG GTGGAGTTCA AGATCAGGCA AGAGAAAAAC ATGTAAAAAG AGTAATCTCC 8280
 CAACTCACCC GGGTACATGG CACCTCTAGC CCTACAAAG GACTAGATCT CTCAAAATA 8340
 CATGAAACCC TCCGTACCCA TACTCGCCTG GTAAGCCTAT TTAATACCAC CCTCACTGGG 8400
 CTCCTAGAGG TCTCGGCCCA AAACCTTACT AACTGTTGGA TATGCTTCCC CCTGAACCTC 8460
 AGGCCATATG TTTCAATCCC TGTACCTGAA CAATGGAAAC ACTTCAGCAC AGAAATAAAC 8520
 ACCACTTCCG TTTTAGTAGG ACCTCTTGT TCCAATCTGG AAATAACCCA TACCTCAAAC 8580
 CTCACCTGTG TAAATTTTAG CAATACTACA TACACACCA ACTCCCAATG CATCAGGTGG 8640
 GTAACCTCTC CCACACAAAT AGTCTGCCTA CCTCAGGAA TATTTTITGT CTGTGGTACC 8700
 TCAGCCTATC GTTGTTTGAA TGGCTCTTCA GAATCTATGT GCTTCCTCTC ATTCTTAGTG 8760
 CCCCCTATGA CCATCTACAC TGAACAAGAT TTATACAGTT ATGTCTATATC TAAGCCCCGC 8820
 AACAAAAGAG TACCCATTCT TCCTTTTGTT ATAGGAGCAG GAGTGCTAGG TGACTAGGT 8880
 ACTGGCATTG GCGGTATCAC AACCTTACT CAGTTTACT ACAAACTATC TCAAGAACTA 8940
 AATGGGACAC TGGAAACGGT CGCCGACTCC CTGGTCACCT TGCAAGATCA ACTTAACTCC 9000
 CTAGCAGCAG TAGTCCTTCA AAATCGAAGA GCTTTAGACT TGCTAACCCG TGAAGAGGG 9060
 GGAACCTGTT TATTTTATGG GGAAGAATGC TGTATTATG TTAATCAATC CGGAATCTC 9120
 ACTGAGAAAG TTAAGAAAT TCAGATCGA ATACAACGTA GAGCAGAGGA GCTTCGAAAC 9180
 ACTGGACCTT GGGGCCTCCT CAGCCATAGG ATGCCCTGGA TTCTCCCTCT CTTAGGACCT 9240
 CTAGCAGCTA TAATATTGCT ACTCTCTTTT GGACCTGTA TCTTTAACTT CTTGTGTAAC 9300
 TTTGTCTCTT CCAGAATCGA AGCTGTAAAT CTACAAATGG AGCCCCAGAT GCAGTCCAG 9360
 ACTAAGATCT ACCCGAGACC CCTGGACCGG CCGCTAGCC CAGGATCTGA TGTTAATGAC 9420
 ATCAAAGGCA CCCCTCTTGA GGAAATCTCA GCTGCACAAC CTCTACTAGC CCCCATTCTA 9480
 GCAGGAAGCA GTTAGAGCGG TCTCGGCCAA CCTCCCAAC AGCACTTAGT TTTTCTGTGT 9540

FIGURE 17

41/64

AAGCTCCTTCAGGAGAACAAAGAACAGGCCATTACCTGGGAGAAGACTGGCAACTGATTTTACCCACAAGCCCAA
 LysLeuLeuGlnGluAsnLysGluGlnAlaIleThrLeuGluLysThrGlyAsn...PheTyrProGlnAlaGln
 SerSerPheArgArgThrLysAsnArgProLeuProTrpArgArgLeuAlaThrAspPheThrHisLysProLys
 AlaProSerGlyGluGlnArgThrGlyHisTyrProGlyGluAspTrpGlnLeuIleLeuProThrSerProAsn

ACCTCAGGAGTTTCAGTATCTACTAGTCTGGGTAGATACCTTCACGGGTGGGACAGGCCCTCCCTGTAGGAC
 ThrSerGlyIleSerValSerThrSerLeuGlyArgTyrPheHisGlyLeuGlyArgGlyLeuProLeu...Asp
 ProGlnGlyPheGlnTyrLeuLeuValTrpValAspThrPheThrGlyTyrAlaGluAlaPheHisLysProLys
 LeuArgAspPheSerIleTyr...SerGly...IleLeuSerArgValGlyGlnArgProSerProValGlyGln

AGAAAGGCCCAAGAGGTAATAAAGGCCTAGTTCATGAAATAATCCAGATTCCGACTTCCCGAGGGCTTACA
 ArgLysGlyProArgGlyAsnLysGlyThrSerSer...AsnAsnSerGlnIleArgTyrProArgLeuThr
 GluLysAlaGlnGluValIleLysAlaLeuValHisGluIleIleProArgPheGlyLeuProArgGlyLeuGln
 LysArgProLysArg...ArgHis...PheMETLys...PheProAspSerAspPheProGluAlaTyrArg

GAGTGACAATAGCCCTGCTTCCAGGCCACAGTAACCCAGGGAGTATCCCGCGCTTAGGTATACGATATCACTT
 Glu...Gln...ProCysPheProGlyHisSerAsnProGlySerIleProGlyValArgTyrThrIleSerLys
 SerAspAsnSerProAlaPheGlnAlaThrValThrGlnGlyValSerGlnAlaLeuGlyIleArgTyrHisLeu
 ValThrIleAlaLeuLeuSerArgProGln...ProArgGluTyrProArgArg...ValTyrAspIleThrTyr

ACACCTGCGCCTGAAGGCCACAGTCTCAGGGAAGGTCGAGAAATGAATGAACACTCAAAGACATCTAAAAA
 ThrLeuArgLysAlaThrValLeuArgGluGlyArgGluAsnGlu...AsnThrGlnArgThrSerLysLys
 HisCysAla...ArgProGlnSerSerGlyLysValGluLysMETAsnGluThrLeuLysGlyHisLeuLysLys
 ThrAlaProGluGlyHisSerProGlnGlyArgSerArgLys...METLysHisSerLysAspIle...LysSer

GCAAACCCAGGAACCCACCTCACATGCGCTGCTCTGTTGCCTATAGCCCTTAAAAAGAAATCGCACTTCCCCCA
 385 395 405 415 425 435 445
 AlaAsnProGlyAsnProProHisMETAlaCysSerValAlaTyrSerLeuLysLysAsnLeuGlnLeuSerPro
 GlnThrGlnGluThrHisLeuThrTrpProAlaLeuLeuProIleAlaLeuLysArgIleCysAsnLeuProGln
 LysProArgLysProThrSerHisGlyLeuLeuCysCysLeu...Pro...LysGluSerAlaThrPheProLys

AAAAGCAGGACTTAGCCCATACGAATGCTGTATGGAAGGCCCTTCATAACCAATGACCTTGCTGTGACCCAAAG
 LysSerArgThr...ProIleArgAsnAlaValTrpLysAlaLeuHisAsnGln...ProCysAla...ProLys
 LysAlaGlyLeuSerProTyrGluMETLeuTyrGlyArgProPheIleThrAsnAspLeuValLeuAspProArg
 LysGlnAspLeuAlaHisThrLysCysCysMETGluGlyProSer...ProMETThrLeuCysLeuThrGlnAsp

ACAGCCAACCTAGTTGCAGACATCACCTCCTTAGCCAAATATCAACAAGTTCTTAAACATTACAAGGAACCTAT
 ThrAlaAsnLeuValAlaAspIleThrSerLeuAlaLysTyrGlnGlnValLeuLysThrLeuGlnGlyThrTyr
 GlnProThr...LeuGlnThrSerProPro...ProAsnIleAsnLysPheLeuLysHisTyrLysGluProIle
 SerGlnLeuSerCysArgHisHisLeuLeuSerGlnIleSerThrSerSer...AsnIleThrArgAsnLeuSer

CCTGAGAAGAGGGAAGAAAGAACTATCCACCCTTGACATGGTATTAGTCAAGTCCCTTCCCTCTAATCCCCCA
 Pro...GluGluGlyLysGluLeuPheHisProCysAspMETValLeuValLysSerLeuProSerAsnSerPro
 ProGluLysArgGluLysAsnTyrSerThrLeuValThrTyr...SerSerProPheThrLysGluIleProHis
 LeuArgArgGlyLysArgThrIleProProLeu...HisGlyIleSerGlnValProSerLeu...PheProIle

TCCCTAGATACATCTGGGAAGGACCTACCCAGTCATTTTATCTACCCCAACTGCGGTTAAAGTGCGCTGGAGTG
 SerLeuAspThrSerTrpGluGlyProTyrProValIleLeuSerThrProThrAlaValLysValAlaGlyVal
 Pro...IleHisProGlyLysAspProThrGlnSerPheTyrLeuProGlnLeuArgLeuLysTrpLeuGluTrp
 ProArgTyrIleLeuGlyArgThrLeuProSerHisPheIleTyrProAsnCysGly...SerGlyTrpSerGly

FIGURE 18.1

42/64

GAGTCTTGGATACATCACACTTGAGTCAARTCTGGATACTGCCAAGGAACCTGAAATCCAGGAGACACGCT
 GluSerTrpIleHisHisThr...ValLysSerTrpIleLeuProLysGluProGluAsnProGlyAspAsnAla
 SerLeuGlyThrIleThrLeuGluSerAsnProGlyTrpCysGlnArgAsnLeuLysIleGlnGluThrThrLeu
 ValLeuAspThrSerHisLeuSerGlnIleLeuAspThrAlaLysGlyThr...LysSerArgArgGlnArg...

AGCTATTCTCTGAACCTCTAGAGGATTTCGCCCTGCTCTTCAACAACAACACGAGGAGAAAGTAACATAAAATCA
 SerTyrSerCysGluProLeuGluAspLeuArgLeuLeuPheLysGlnGlnProGlyGlyLys...LeuLysSer
 AlaIleProValAsnLeu...ArgIleCysAlaCysSerSerAsnAsnAsnGlnGluGluSerAsn...AsnHis
 LeuPheLeu...ThrSerArgGlyPheAlaProAlaLeuGlnThrThrThrArgArgLysValThrLysIleIle

TAAATCCCCATGGCCCTCCCTTATCATATTTTTCTCTTACTGTCTTTTACCCTCTTCTACTCTCACTGCACCC
 ...IleProMETAlaLeuProTyrHisIlePheLeuPheThrValLeuLeuProSerPheThrLeuThrAlaPro
 LysSerProTrpProSerLeuIleIlePhePheSerLeuLeuPhePheTyrProLeuSerLeuSerLeuHisPro
 AsnProHisGlyProLeuSerTrpPheSerLeuTyrCysSerPheThrLeuPheHisLysHisCysThrPro

CCTCCATGCCGTGTATGACCAGTAGCTCCCTTACCAAGAGTTTCTATGGAGAATGCACGCTCCCGAAATATT
 ProProCysArgCysMETThrSerSerSerProTyrGlnGluPheLeuTrpArgMETGlnArgProGlyAsnIle
 LeuHisAlaAlaVal...ProValAlaProLeuThrLysSerPheTyrGlyGluCysSerValProGluIleLeu
 SerMETProLeuTyrAspGln...LeuProLeuProArgValSerMETGluAsnAlaAlaSerArgLysIleIle

GATGCCCATCGTATAGGAGTCTTTCTAAGGGAACCCCACTTCACTGCCACACCCATATGCCCGCAACTGC
 AspAlaProSerTyrArgSerLeuSerLysGlyThrProThrPheThrAlaHisThrHisMETProArgAsnCys
 METProHisArgIleGlyValPheLeuArgGluProProSerLeuProThrProIleCysProAlaThrAla
 CysProIleVal...GluSerPhe...GlyAsnProHisLeuHisCysProHisProTyrAlaProGlnLeuLeu

TATCACTCTGCCACTCTTGTGCATGCATAACTCATTATTGGACAGGAAAAATGATTAATCTAGTTGTCTCT
 TyrHisSerAlaThrLeuCysMETHisAlaAsnThrHisTyrTrpThrGlyLysMETIleAsnProSerCysPro
 IleThrLeuProLeuPheAlaCysMETGlnIleLeuIleIleGlyGlnGluLys...LeuIleLeuValValLeu
 SerLeuCysHisSerLeuHisAlaCysLysTyrSerLeuLeuAspArgLysAsnAsp...Ser...LeuSerTrp

GGAGGACTTGGAGTCACTGTCTGTGGACTTACTTACCCAACTGGTATGTCTGATGGGGGTGGAGTCAAGAT
 GlyGlyLeuGlyValThrValCysTrpThrTyrPheThrGlnThrGlyMETSerAspGlyGlyValGlnAsp
 GluAspLeuGluSerLeuSerValGlyLeuThrSerProLysLeuValCysLeuMETGlyValGluPheLysIle
 ArgThrTrpSerHisCysLeuLeuAspLeuHisProAsnTrpTyrVal...TrpGlyTrpSerSerArgSer

CAGGCAAGAGAAAAACATGTAAAGAAAGTAATCTCCCACTCACCAGGATACATGGCACCTCTAGCCCTACAAA
 GlnAlaArgGluLysHisValLysGluValIleSerGlnLeuThrArgValHisGlyThrSerSerProTyrLys
 ArgGlnGluLysAsnMET...LysLys...SerProAsnSerProGlyTyrMETAlaProLeuAlaProThrLys
 GlyLysArgLysThrCysLysArgSerAsnLeuProThrHisProGlyThrTrpHisLeu...ProLeuGlnArg

GGACTAGATCTCTCAAACTACATGAACCCCTCCGTACCCATACTCGCCTGGTAAGCCTTTAATAACCCACCTC
 GlyLeuAspLeuSerLysLeuHisGluThrLeuArgThrHisThrArgLeuValSerLeuPheAsnThrThrLeu
 Asp...IleSerGlnAsnTyrMETLysProSerValProIleLeuAlaTrp...AlaTyrLeuIleProProSer
 ThrArgSerLeuLysThrThr...AsnProProTyrProTyrSerProGlyLysProIle...TyrHisProHis

ACTGGGCTCCATGAGGTCTCGGCCCAAACCTCACTAACTGTGGATATGCCTCCCTGAACTTCAGGCCATAT
 ThrGlyLeuHisGluValSerAlaGlnAsnProThrAsnCysTrpIleCysLeuProLeuAsnPheArgProTyr
 LeuGlySerMETArgSerArgProLysThrLeuLeuThrValGlyTyrAlaSerPro...ThrSerGlyHisMET
 TrpAlaPro...GlyLeuGlyProLysProTyr...LeuLeuAspMETProProProGluLeuGlnAlaIleCys

GTTTCAATCCCTGTACCTGAACAATGGAACAACCTCAGCACAGAAATAAACACCACTTCCGCTTTAGTAGGACCT
 ValSerIleProValProGluGlnTrpAsnAsnPheSerThrGluIleAsnThrThrSerValLeuValGlyPro
 PheGlnSerLeuTyrLeuAsnAsnGlyThrThrSerAlaGlnLys...ThrProLeuProPhe...AspLeu
 PheAsnProCysThr...ThrMETGluGlnLeuGlnHisArgAsnLysHisHisPheArgPheSerArgThrSer

FIGURE 18.2

43/64

CTTGTTCACATCTGGAAATAACCCATACCTCAAACCTCACCTGTGTAAAATTAGCAATACTACATACACAACC
LeuValSerAsnLeuGluIleThrHisThrSerAsnLeuThrCysValLysPheSerAsnThrThrTyrThrThr
 LeuPheProIleTrpLys...ProIleProGlnThrSerProVal...AsnLeuAlaIleLeuHisThrGlnPro
 CysPheGlnSerGlyAsnAsnProTyrLeuLysProHisLeuCysLysIle...GlnTyrTyrIleHisAsnGln

AACCTCCCATGCATCAGGTGGGTAACCTCCTCCACACAAATAGTCTGCCTACCTCCAGGAATATTTTTGTCTGT
AsnSerGlnCysIleArgTrpValThrProProThrGlnIleValCysLeuProSerGlyIlePhePheValCys
 ThrProAsnAlaSerGlyGly...LeuLeuProHisLys...SerAlaTyrProGlnGluTyrPheLeuSerVal
 LeuProMETHisGlnValGlyAsnSerSerHisThrAsnSerLeuProThrLeuArgAsnIlePheCysLeuTrp

GGTACCTCAGCCTCATCTGTTGTTGAATGGCTCTTCAGAACTCTATGTGCTTCTCTCATTCTTAGTGCCCCCTATG
GlyThrSerAlaTyrArgCysLeuAsnGlySerSerGluSerMETCysPheLeuSerPheLeuValProProMET
 ValProGlnProIleValVal...METAlaLeuGlnAsnLeuCysAlaSerSerHisSer...CysProLeu...
 TyrLeuSerLeuSerLeuPheGluTrpLeuPheArgIleTyrValLeuProLeuIleLeuSerAlaProTyrAsp

ACCATCTACACTGAACAGAGATTTATACAGTTATGTCAATCTAAGCCCCGACACAAAGAGTACCCATTCTCTCT
ThrIleTyrThrGluGlnAspLeuTyrSerTyrValIleSerLysProArgAsnLysArgValProIleLeuPro
 ProSerThrLeuAsnLysIleTyrThrValMETSerTyrLeuSerProAlaThrLysGluTyrProPhePheLeu
 HisLeuHis...ThrArgPheIleGlnLeuCysHisIle...AlaProGlnGlnLysSerThrHisSerSerPhe

TTTGTATTAGGAGCAGGAGTGCTAGGTGCACATAGGTACTGGCATTGGCGGTATCACAACTCTCACTAGTTCTAC
PheValIleGlyValGlyValLeuGlnValLeuGlyThrGlyIleGlyGlyIleThrThrSerGlnGlnThrTyr
 LeuLeu...GluGlnGluCys...ValHis...ValLeuAlaLeuAlaValSerGlnProLeuLeuSerSerThr
 CysTyrArgSerArgSerAlaArgCysThrArgTyrTrpHisTrpArgTyrHisAsnLeuTyrSerValLeuLeu

TACAACTATCTCAAGAATAAATGGGACATGGAACGGGTCCGCCACTCCCTGGTCACTTGCAGAGTCAACTT
TyrLysLeuSerGlnGluLeuAsnGlyAspMETGluArgValAlaAspSerLeuValThrLeuGlnAspGlnLeu
 ThrAsnTyrLeuLysAsn...METGlyThrTrpAsnGlySerProThrProTrpSerProCysLysIleAsnLeu
 GlnThrIleSerArgThrLysTrpGlyHisGlyThrGlyArgArgLeuProGlyHisLeuAlaArgSerThr...

AACCTCCCTAGCAGCAGTAGTCTCTCAAATCGAAGAGCTTTAGACTTGCTAACCGCTGAAGAGGGGGAACCTGT
AsnSerLeuAlaAlaValValLeuGlnAsnArgArgAlaLeuAspLeuLeuThrAlaGluArgGlyGlyThrCys
 ThrPro...GlnGln...SerPheLysIleGluGluLeu...ThrCys...ProLeuLysGluGlyGluProVal
 LeuProSerSerSerSerSerLysSerLysSerPheArgLeuAlaAsnArg...LysArgGlyAsnLeuPhe

TTATTTTAGGGGAAGAATGCTGTTATTATGTTAATCAATCCGGAATCGTCACTGAGAAGTTAAAGAAATTCGA
LeuPheLeuGlyGlyGluGlyCysCysTyrTyrValAsnGlnSerGlyIleValThrGluLysValLysGluIleArg
 TyrPhe...GlyLysAsnAlaValIleMETLeuIleAsnProGluSerSerLeuArgLysLeuLysPheGlu
 IlePheArgGlyLeuMETLeuLeuLysCys...SerIleArgAsnArgHis...GluSer...LysAsnArgSerArg

GATCGAATACAACGTAGAGCAGAGGAGCTTCGAACACTGGACCTGGGGCTCCTCAGCAATGGATGCCCTGG
AspArgIleGlnArgArgAlaGluGluLeuArgAsnThrGlyProTrpGlyLeuLeuSerGlnTrpMETProTrp
 IleGluTyrAsnValGluGlnArgSerPheGluThrLeuAspProGlyAlaSerSerAlaAsnGlyCysProGly
 SerAsnThrThr...SerArgGlyAlaSerLysHisTrpThrLeuGlyProGlnProMetAspAlaLeuAsp

ATTCTCCCTTCTTAGGACCTCTAGCAGCTATAATATGTCTACTCTCTTTGGACCTGTATCTTTAACTCCTT
IleLeuProPheLeuGlyProLeuAlaAlaIleIleLeuLeuLeuPheGlyProCysIlePheAsnLeuLeu
 PheSerProSer...AspLeu...GlnLeu...TyrCysTyrSerSerLeuAspProValSerLeuThrSerLeu
 SerProLeuArgThrSerSerSerTyrAsnIleAlaThrProLeuTrpThrLeuTyrLeu...ProProCys

FIGURE 18.3

09719554-011001

44/64

GTAACTTTGTCTCTTCCAGAATCGAAGCTGTAAACTACAAATGGAGCCCAAGATGCAGTCCAAGACTAAGATC
ValAsnPheValSerSerArgIleGluAlaValIysLeuGlnMETGluProIvsMETGlnSerLvsThrLvsIle
LeuThrLeuSerLeuProGluSerLysLeu...AsnTyrLysTrpSerProArgCysSerProArgLeuArgSer
...LeuCysLeuPheGlnAsnArgSerCysLysThrThrAsnGlyAlaGlnAspAlaValGlnAsp...AspLeu

TACCGCAGACCCCTGGACCGGCTGCTAGCCCCAGATCTGATGTTAATGACATCAAAGGCACCCCTCCTGAGGAA
TyrArgArgProLeuAspArgProAlaSerProArgSerAspValAsnAspIleLvsGlvThrProProGluGlu
ThrAlaAspProTrpThrGlyLeuLeuAlaHisAspLeuMETLeuMETThrSerLysAlaProLeuLeuArgLys
ProGlnThrProGlyProAlaCys...ProThrIle...Cys.....HisGlnArgHisProSer...GlyAsn

ATCTCAGCTGCACAACTCTACTACGCCCCAATTACAGCAGGAAGCAGTTAGAGCGGTCGTCGGCCAACCTCCCCA
IleSerAlaAlaGlnProLeuLeuArgProAsnSerAlaGlvSerSer...SerGlyArgArgProThrSerPro
SerGlnLeuHisAsnLeuTyrTyrAlaProIleGlnGlnGluAlaValArgAlaValValGlyGlnProProGln
LeuSerCysThrThrSerThrThrProGlnPheSerArgLysGlnLeuGluArgSerSerAlaAsnLeuProAsn

ACAGCACTTAGGTTTTCTGTTGAGATGGGGG
ThrAlaLeuArgPheSerCys...AspGlyGly
GlnHisLeuGlyPheProValGluMETGly
SerThr...ValPheLeuLeuArgTrpGly

FIGURE 18.4

09719554-01164

45/64

ThrSerGlyIleSerValSerThrSerLeuGlyArgTyrPheHisGlyLeuGlyArgGlyLeuProLeu... Asp
 ArgLysGlyProArgGlyAsnLysGlyThrSerSer... AsnAsnSerGlnIleArgThrSerProArgLeuThr
 Glu... Gln... ProCysPheProGlyHisSerAsnProGlySerIleProGlyValArgTyrThrIleSerLeu
 ThrLeuArgLeuLysAlaThrValLeuArgGluGlyArgGluAsnGlu... AsnThrGlnArgThrSerLysLys
 AlaAsnProGlyAsnProProHisMETAlaCysSerValAlaTyrSerLeuLysLysAsnLeuGlnLeuSerPro
 LysSerArgThr... ProIleArgAsnAlaValTrpLysAlaLeuHisAsnGln... ProCysAla... ProLys
 ThrAlaAsnLeuValAlaAspIleThrSerLeuAlaIlysTyrGlnGlnValLeuLysThrLeuGlnGlyThrTyr
 Pro... GluGluGlyLysGluLeuPheHisProCysAspMETValLeuValLysSerLeuProSerAsnSerPro
 SerLeuAspThrSerTrpGluGlyProTyrProValIleLeuSerThrProThrAlaValLysValAlaGlyVal
 GluSerTrpIleHisHisThr... ValLysSerTrpIleLeuProLysGluProGluAsnProGlyAspAsnAla
 SerTyrSerCysGluProLeuGluAspLeuArgLeuLeuPheLysGlnGlnProGlyGlyLys... LeuLysSer
 ... IleProMETAlaLeuProTyrHisIlePheLeuPheThrValLeuLeuProSerPheThrLeuThrAlaPro
 ProProCysArgCysMETThrSerSerSerProTyrGlnGluPheLeuTrpArgMETGlnArgProGlyAsnIle
 AspAlaProSerTyrArgSerLeuSerLysGlyThrProThrPheThrAlaHisThrHisMETProArgAsnCys
 TyrHisSerAlaThrLeuCysMETHisAlaAsnThrHisTyrTrpThrGlyLysMETIleAsnProSerCysPro
 GlyGlyLeuGlyValThrValCysTrpThrTyrPheThrGlnThrGlyMETSerAspGlyGlyGlyValGlnAsp
 GlnAlaArgGluLysHisValLysGluValIleSerGlnLeuThrArgValHisGlyThrSerSerProTyrLys
 GlyLeuAspLeuSerLysLeuHisGluThrLeuArgThrHisThrArgLeuValSerLeuPheAsnThrThrLeu
 ThrGlyLeuHisGluValSerAlaGlnAsnProThrAsnCysTrpIleCysLeuProLeuAsnPheArgProTyr
 ValSerIleProValProGluGlnTrpAsnAsnPheSerThrGluIleAsnThrThrSerValLeuValGlyPro
 LeuValSerAsnLeuGluIleThrHisThrSerAsnLeuThrCysValLysPheSerAsnThrThrTyrThrThr
 AsnSerGlnCysIleArgTrpValThrProProThrGlnIleValCysLeuProSerGlyIlePhePheValCys
 GlyThrSerAlaTyrArgCysLeuAsnGlySerSerGluSerMETCysPheLeuSerPheLeuValProProMET
 ThrIleTyrThrGluGlnAspLeuTyrSerTyrValIleSerLysProArgAsnLysArgValProIleLeuPro
 PheValIleGlyAlaGlyValLeuGlyAlaLeuGlyThrGlyIleGlyGlyIleThrThrSerThrGlnPheTyr
 TyrLysLeuSerGlnGluLeuAsnGlyAspMETGluArgValAlaAspSerLeuValThrLeuGlnAspGlnLeu

FIGURE 19.1

46/64

AsnSerLeuAlaAlaValValLeuGlnAsnArgArgAlaLeuAspLeuLeuThrAlaGluArgGlyGlyThrCys
LeuPheLeuGlyGluGluCysCysTyrTyrValAsnGlnSerGlyIleValThrGluLysValLysGluIleArg
AspArgIleGlnArgArgAlaGluGluLeuArgAsnThrGlyProTrpGlyLeuLeuSerGlnTrpMETProTrp
IleLeuProPheLeuGlyProLeuAlaAlaIleIleLeuLeuLeuLeuPheGlyProCysIlePheAsnLeuLeu
ValAsnPheValSerSerArgIleGluAlaValLysLeuGlnMETGluProLysMETGlnSerLysThrLysIle
TyrArgArgProLeuAspArgProAlaSerProArgSerAspValAsnAspIleLysGlyThrProProGluGlu
IleSerAlaAlaGlnProLeuLeuArgProAsnSerAlaGlySerSer...SerGlyArgArgProThrSerPro
ThrAlaLeuArgPheSerCys...AspGlyGly

FIGURE 19.2

47/64

SerSerPheArgArgThrLysAsnArgProLeuProTrpArgArgLeuAlaThrAspPheThrHisLysProLys
 ProGlnGlyPheGlnTyrLeuLeuValTrpValAspThrPheThrGlyTrpAlaGluAlaPheProCysArgTnr
 GluLysAlaGlnGluValIleLysAlaLeuValHisGluIleIleProArgPheGlyLeuProArgGlyLeuGln
 SerAspAsnSerProAlaPheGlnAlaThrValThrGlnGlyValSerGlnAlaLeuGlyIleArgTyrHisLeu
 HisCysAla...ArgProGlnSerSerGlyLysValGluLysMETAsnGluThrLeuLysGlyHisLeuLysLys
 GlnThrGlnGluThrHisLeuThrTrpProAlaLeuLeuProIleAlaLeuLysArgIleCysAsnPheProGln
 LysAlaGlyLeuSerProTyrGluMETLeuTyrGlyArgProPheIleThrAsnAspLeuValLeuAspProArg
 GlnProThr...LeuGlnThrSerProPro...ProAsnIleAsnLysPheLeuLysHisTyrLysGluProIle
 ProGluLysArgGluLysAsnTyrSerThrLeuValThrTrpTyr...SerSerProPheProLeuIleProHis
 Pro...IleHisProGlyLysAspProThrGlnSerPheTyrLeuProGlnLeuArgLeuLysTrpLeuGluTrp
 SerLeuGlyTyrIleThrLeuGluSerAsnProGlyTyrCysGlnArgAsnLeuLysIleGlnGluThrThrLeu
 AlaIleProValAsnLeu...ArgIleCysAlaCysSerSerAsnAsnAsnGlnGluGluSerAsn...AsnHis
 LysSerProTrpProSerLeuIleIlePhePheSerLeuLeuPhePheTyrProLeuSerLeuSerLeuHisPro
 LeuHisAlaAlaVal...ProValAlaProLeuThrLysSerPheTyrGlyGluCysSerValProGluIleLeu
 METProHisArgIleGlyValPheLeuArgGluProProProSerLeuProThrProIleCysProAlaThrAla
 IleThrLeuProLeuPheAlaCysMETGlnIleLeuIleIleGlyGlnGluLys...LeuIleLeuValValLeu
 GluAspLeuGluSerLeuSerValGlyLeuThrSerProLysLeuValCysLeuMETGlyValGluPheLysIle
 ArgGlnGluLysAsnMET...LysLys...SerProAsnSerProGlyTyrMETAlaProLeuAlaProThrLys
 Asp...IleSerGlnAsnTyrMETLysProSerValProIleLeuAlaTrp...AlaTyrLeuIleProProSer
 LeuGlySerMETArgSerArgProLysThrLeuLeuThrValGlyTyrAlaSerPro...ThrSerGlyHisMET
 PheGlnSerLeuTyrLeuAsnAsnGlyThrThrSerAlaGlnLys...ThrProLeuProPhe.....AspLeu
 LeuPheProIleTrpLys...ProIleProGlnThrSerProVal...AsnLeuAlaIleLeuHisThrGlnPro
 ThrProAsnAlaSerGlyGly...LeuLeuProHisLys...SerAlaTyrProGlnGluTyrPheLeuSerVal
 ValProGlnProIleValVal...METAlaLeuGlnAsnLeuCysAlaSerSerHisSer...CysProLeu...
 ProSerThrLeuAsnLysIleTyrThrValMETSerTyrLeuSerProAlaThrLysGluTyrProPhePheLeu
 LeuLeu...GluGlnGluCys...ValHis...ValLeuAlaLeuAlaValSerGlnProLeuLeuSerSerThr
 ThrAsnTyrLeuLysAsn...METGlyThrTrpAsnGlySerProThrProTrpSerProCysLysIleAsnLeu
 ThrPro...GlnGln...SerPheLysIleGluGluLeu...ThrCys...ProLeuLysGluGlyGluProVal

FIGURE 20.1

48/64

TyrPhe...GlyLysAsnAlaValIleMETLeuIleAsnProGluSerSerLeuArgLysLeuLysLysPheGlu
IleGluTyrAsnValGluGlnArgSerPheGluThrLeuAspProGlyAlaSerSerAlaAsnGlyCysProGly
PheSerProSer...AspLeu...GlnLeu...TyrCysTyrSerSerLeuAspProValSerLeuThrSerLeu
LeuThrLeuSerLeuProGluSerLysLeu...AsnTyrLysTrpSerProArgCysSerProArgLeuArgSer
ThrAlaAspProTrpThrGlyLeuLeuAlaHisAspLeuMETLeuMETThrSerLysAlaProLeuLeuArgLys
SerGlnLeuHisAsnLeuTyrTyrAlaProIleGlnGlnGluAlaValArgAlaValValGlyGlnProProGln
GlnHisLeuGlyPheProValGluMETGly

FIGURE 20.2

09719554-01513

49/64

AlaProSerGlyGluGlnArgThrGlyHisTyrProGlyGluAspTrpGlnLeuIleLeuProThrSerProAsn
LeuArgAspPheSerIleTyr...SerGly...IleLeuSerArgValGlyGlnArgProSerProValGlyGln
LysArgProLysArg.....ArgHis...PheMETLys...PheProAspSerAspPheProGluAlaTyrArg
ValThrIleAlaLeuLeuSerArgProGln...ProArgGluTyrProArgArg...ValTyrAspIleThrTyr
ThrAlaProGluGlyHisSerProGlnGlyArgSerArgLys...METLysHisSerLysAspIle...LysSer
LysProArgLysProThrSerHisGlyLeuLeuCysCysLeu...Pro...LysGluSerAlaThrPheProLys
LysGlnAspLeuAlaHisThrLysCysCysMETGluGlyProSer...ProMETThrLeuCysLeuThrGlnAsp
SerGlnLeuSerCysArgHisHisLeuLeuSerGlnIleSerThrSerSer...AsnIleThrArgAsnLeuSer
LeuArgArgGlyLysArgThrIleProProLeu...HisGlyIleSerGlnValProSerLeu...PheProIle
ProArgTyrIleLeuGlyArgThrLeuProSerHisPheIleTyrProAsnCysGly...SerGlyTrpSerGly
ValLeuAspThrSerHisLeuSerGlnIleLeuAspThrAlaLysGlyThr...LysSerArgArgGlnArg...
LeuPheLeu...ThrSerArgGlyPheAlaProAlaLeuGlnThrThrThrArgArgLysValThrLysIleIle
AsnProHisGlyProProLeuSerTyrPheSerLeuTyrCysSerPheThrLeuPheHisSerHisCysThrPro
SerMETProLeuTyrAspGln...LeuProLeuProArgValSerMETGluAsnAlaAlaSerArgLysTyr...
CysProIleVal...GluSerPhe...GlyAsnProHisLeuHisCysProHisProTyrAlaProGlnLeuLeu
SerLeuCysHisSerLeuHisAlaCysLysTyrSerLeuLeuAspArgLysAsnAsp...Ser...LeuSerTrp
ArgThrTrpSerHisCysLeuLeuAspLeuLeuHisProAsnTrpTyrVal...TrpGlyTrpSerSerArgSer
GlyLysArgLysThrCysLysArgSerAsnLeuProThrHisProGlyThrTrpHisLeu...ProLeuGlnArg
ThrArgSerLeuLysThrThr...AsnProProTyrProTyrSerProGlyLysProIle...TyrHisProHis
TrpAlaPro...GlyLeuGlyProLysProTyr...LeuLeuAspMETProProProGluLeuGlnAlaIleCys
PheAsnProCysThr...ThrMETGluGlnLeuGlnHisArgAsnLysHisHisPheArgPheSerArgThrSer
CysPheGlnSerGlyAsnAsnProTyrLeuLysProHisLeuCysLysIle...GlnTyrTyrIleHisAsnGln
LeuProMETHisGlnValGlyAsnSerSerHisThrAsnSerLeuProThrLeuArgAsnIlePheCysLeuTrp
TyrLeuSerLeuSerLeuPheGluTrpLeuPheArgIleTyrValLeuProLeuIleLeuSerAlaProTyrAsp
HisLeuHis...ThrArgPheIleGlnLeuCysHisIle...AlaProGlnGlnLysSerThrHisSerSerPhe
CysTyrArgSerArgSerAlaArgCysThrArgTyrTrpHisTrpArgTyrHisAsnLeuTyrSerValLeuLeu
GlnThrIleSerArgThrLysTrpGlyHisGlyThrGlyArgArgLeuProGlyHisLeuAlaArgSerThr...
LeuProSerSerSerSerProSerLysSerLysSerPheArgLeuAlaAsnArg...LysArgGlyAsnLeuPhe

FIGURE 21.1

50/64

IlePheArgGlyArgMETLeuLeuLeuCys...SerIleArgAsnArgHis...GluSer...ArgAsnSerArg
SerAsnThrThr...SerArgGlyAlaSerLysHisTrpThrLeuGlyProProGlnProMETAspAlaLeuAsp
SerProLeuLeuArgThrSerSerSerTyrAsnIleAlaTnrProLeuTrpThrLeuTyrLeu...ProProCys
...LeuCysLeuPheGlnAsnArgSerCysLysThrThrAsnGlyAlaGlnAspAlaValGlnAsp...AspLeu
ProGlnThrProGlyProAlaCys...ProThrIle...Cys.....HisGlnArgHisProSer...GlyAsn
LeuSerCysThrThrSerThrThrProGlnPheSerArgLysGlnLeuGluArgSerSerAlaAsnLeuProAsn
SerThr...ValPheLeuLeuArgTrpGly

FIGURE 21.2

09719554-011301

TTGGTCTTAAAGAACACAAATGATATGGCTCCAATGACTGGAGGAACACCGAGGTCCTTGG
TCTCAGCGTGATTTAGATAAAAAAGACTGTGAGGCCCTCTGAGCCCAAGCTAAGCCATCCTC
CCCTGTGACCTGCACGTATACATCCAGATGGCTGAAGTAACCAAGAATCACAAAAGCA
GTGAAGAAATGGCCCTGTTCCTGGCCTTAAGTATGACATTCCACCATTTGTGATTTGTTCCTGC
CCCATCTTAAGTGAAGCGATTAACTTGTGAATTCCTTCTCCTGGCTCAAAACCTCCCC
ACTGAGCAGCTTGTGACCCCGGCCCTGCCCTTAAGAGAAAAACCCCTTTGATTATATATT
TTCCACTACCCACCCAAATCCTATAAAATGGCCCCACCCCTATCTCCCTTTCGTGACTCC
TTTTTGGGATCTCAGCCCGCCTGCACCCAGGTGAATTAACAGCCCTTGTGTCTCACACAAA
GCCCTGTTTGGTGGAGCTCTCTTCAACGAGCGCTCATGACATTTGGTGCCAAAACCTGGGA
TAGGAGGACTCCTTCAGGAGACCACTGCCCTGTCTTGCCTCCTCTGTGAGGACATCC
ACCTACACACTTGGGTCTCTAGACCAACCAAGCCCAAGGAACAGCTCACCAGATTTCAAACT
AGGTAAAGCAGTCTTCACTCTCTTCTCCAGCCTCTCTTGTCTACCCCTTCAAACTCCCTCT
CTCACTACCCCTTCAATCTCCCTGTCTCTTCAATTCAGTTCTTTTTTCATCTCTAGTAGAG
ACAAAGGAGACACATTTTATCCATGGACCCAAACCTCCAGCACCAAGTCAAGGACTTGGGA
AGACAGTCTTCCCTTGGTGTTTAATCACTGCGGGGACGCGTCCCTGATTTATCCACCA
CTCCATTTGGTGTCTGATCAGCGTGGGGACACCTGCCCTTGGTCACTACCCACATTTCCCTT
GGTGTACGTCAACTGCAAAAGCAGGGGACGCTGTCTTGGCTGTCTACCCACCCCTCTC
TCTGTCTCTCACTCTTCTCTTTAACTTCACTCTCTTCACTAGGGAAGCTTCTGCGCCT
CCATTCGCCCTTCTCTCCCTTAGCCTGTGTCTTAAAAACCTAAAACTCTCTCAACTCA
CACCTGACCTAAAACTAAATGCCTTATTTCTTCTGCAACACTGCGTGGTGTGAGTACA
AACTTGATAATAGCTTTAAATGGCCAGAATATGGCACTTTCAATTTCTCCATCCTACAAG
ATCTAGATAATTTTGTGGAAAAATGAAAAATGGTCTGAGATGCGCTGACGCTCCAGGACAT
TCTTTTACACATTTGCTCCCTCCCTAGTCTCTGCTCCCAATGCGACTCATCCCAAACTCTT
CTTCTTCTCTCCTGTCTGTCTTCTCAGTCTCCACCCCAAGCTCTGAGTCTTTTGAATCC
TCCTTTGTCTACAGACCCATCTGAAGTCTCCTCCCTCTCCTCCCGAGGCTGTCTCCTCAGCAGGC
GAGCCAGGTCCCAATTCTTCTCAGCCTCTGCTCCCCCAACCCATAAATCCTTTTATCACC
TCCTCTCTCTCAGCTCAGTCCGCGCTTACAGTTTCTGTCTGTGACTAGCCCTCCCCATCT
GCCCAACAATTTCTCTTAAAGAGGTGGCTGGAGCTAAAGGCATAGTCAAGGTTAATGCT
CCTTTTTCTTTATCTGACCTCTCCCAAATCAGTTAGCGTTTACGCTCTTTTTTCATCAAAAT
ATAAAACCCAGCCAGTTTATGGCCCACTTGGCAACAACCCCTTACAGGCTTTTACAGCCCT
AGACCTGAAAGGTGAGAAGGCCGTCTTATTTCAATATGCATTTTATACCAATCCGC
TCCCAACATTAATAAAGCTCCAAAAATTAATTTCTGGCCCTCAAACCCCAACAGGAC
TTAATTAACCTCACTTCAAGGTGTACAAGAATAGAGTAGAGGACGAGCCAAAGTAGCAACGTA
TTTTAGTTGCAATTTCTTGCCTCACTCTGAGAGAAACCCCAAGCCATCTCCAGCAAAAC
AAGAATCTCAAAACACCTGAAGTGCAGCAGCCAGGCGTTCTCCAGGACCACCTCCCCCA
GGATCTTGCTTCAAGTCCCGGAAATCTGACCATTTGGGCCAAGGAATGCTTGACGCCAGG
ATTCTCTTAAGCCACGTCCTTCTTGTGACGAGCCCACTGGAAATCGGACTGTCCAACT
CACC CGGACGCAATCCAGAGCCCTGGAAGTCTGCCCCAAGGCTCTCTGACTGACTCC
TTCCAGAGTCTTCTCGGCTTAGCAGCTGAAGACTGACACTGCCCGATCACTCTCAGAAGTC
CCCTGGACCATCAGGTAAGTCTGAGTCTCAGGTAAGTCTCAGAGTGGAGGCTAAGTCCATC
CCCTGTTTAAATGATACAGGGGCTACCCAGCTCCACATCACCTTCTTTTCAAGGGCCTGTT
TCCCTTTCCCCGATAACTGTTGTGGGTATTGACGGCCAAGCTTCAAACCCCTTAAAACT
CCCCCATCTGCTGGCAACTTGGACAACATTTCTTTATGCACTCTTTTTCAGTTACTCTC
ACCTGCCAGGTTCCCTTATTAGGCGGAGACATTTAACCAGAAATATCTGCTTCCCGACT
ATTCTGGGCTACAGCCACATCTCCTTGGCGCCCTTCTTCCCAACCAAGCCTCTCTCA
TATCTTCTCTCATATCCCCCAGCTTAACCCCAAGATGGGACACCTCTACTCCCTCC
CTGGCAACCGATCACAGCCCATTAATCTCCCATTAACCACTAATCACCCCTTACCCCTGT
CAATGCCAGTATCCCATACCAACAGGCTTTAAAGGATTGAAGCTGTATCACTTGC

FIGURE 22.1

52/64

CTGCTACAGCA CGGGCTTCTAAAACCTATAAACTCTCCATACAATTCCCCCATTTTACCT
GTCTAAAAACCAGATAAGTCTTACAGGTTAGTTTCAGAATCTGCACCTTATCAACCAAAAT
GTTTTCGCTATCCACCTGTAGCACCACTCGTACACTCTTTGTCTCAATGCCTTCC
CCACAGACTCACTATTCGGTTCTTGATCTTAAAGATGCTTTTTCATATTCCCTCGCAC
CCCTCATCCCGACCTCTCTTTGCTTTTACCTGGAGTGAACCTGACACCCATCACTGCTCCAG
CAGCTTACCTGGGCTGTACTGCCGAAGGCTTCAGGACAGCCCTCATCTTTCAGCCAA
GCTCTTTCTCATGATTACTTTCTTCCACCTCTGCTTTCTCACCTTATTCAATATATT
GATGACCTCTCTATTGTTAGCCCTCTCTTAAATCTTCTCAACAAAGACACCTCTCGTGCT
CTTCAACATTTGTTCTCCAAAGGATATCGGATATCCCTCCAAAGCTCAAAATTTCTCTCT
CCATCTGTTACATACCTCGGCATAATTCTTCATGAAAACATGTGCTCTCCCTGCCAAT
TGCGTCTCCAACTGATCTCTCAATCCCAACCTCTTCTACAAAACCAACCTCTTCCCT
TCTAGGCAATGGTTGGATACTTTTGCTTTGGATACCTGGTTTGGCATCTTCAACAAAT
CATTATATAAACTCAACAAAGGAAACCTAGCTGACCCCATAGATTCTAAATCTTTCCCT
ACTCTCTCTTCCATCTCTGAAGACAGCTTTAGAGACTGCTCCACACATAGCTCTCCCTG
TCTCATCCCAACCCCTTTTCATTACACACAGCCGAAGTGACAGGCTGTGCACTCGGAATTC
TTACACAGGACCGGGACCATGCCCTGTAGCCTTTTGTCCAAACAACTTGACCTTACTG
TTTTAGGCTCGCCATCATGTCTCCATGCGGTAGCTTCCGCTGCCCTAATACTTTTAGAGG
CCCTCAAAATCAACAACTATGCTCAACTCACTCTACAGCTCTCAACAGCTTCAAAATTC
TATTTCTTTCTCAACCTGACGATATACTTTCTGCTCCCGGCTCCTTCAGCTGTATT
CACTCTTTGTTGAGTCTCCACAAATTACCATTCTTCTGCGCCAGACTCAATCTGCGCT
CCACATATTCTTGGATACCAACCTGACCCCTGATGATTGTCTCTGATCTCACTGTA
CATTCACCCCAATTTCCCATATTTCCTTCTTTCTGTTCTCATGTTGATCAGATTGGT
TTACTGACGGCAGTTCCACAGGCTGATCGCCACTGCACGCAAGGCCAGGCTATGCTA
TAGAATCTTCCACATCCATCATTGAGGCTACTGCTCTGCCCTCCACTACCTCTCAGC
AAGCCGAAGCTGATTGCCTTAACTCGGCTTCACTCTTGCAAAAGGACATACAGCTCAATA
TTTATACTGACTCTAAATATGCCTTCCATATCTTGACACCATGCTGTTATATGGGCTG
AAAGAGGTTTCTCTCACTACGCAAGGCTCTCCATCATTAATGCTCTTTAATAAAACCTC
TTCTCAAGGCTGCTTACTTCCAAAGGAAGCTGGAGTCACACACTGCAAGGGGCCACAAA
AGGCTCAGATCCCATTACTTAGGAAATGCTTATGCTGATAAGGTAGCTAAAGAAAGCAC
CTAGCGTTCCAACTTCTGCTCCTCATGGCCAGTTTTTCTCCTTCCCATCAGTCATTCCCA
CCTACTCCCCCATTTGAAACTTCCGCTTATCAATCTCTTCTCACACAGGCAAAATGGTTCT
TAGACCAAGGAAAAATATCTCCTTCCAGCCTCACAGGCCCATTTCTATTCTGATCATTTT
ATAACCTCTTCCATGAGTTTACAAGCCACTAGTCCACCTCTTGAACCTCTGATTTCTCT
TCCATCTGGGAAACATATCTCTCAAGGAAATCACTTCTCAGTGTCCCATCTCTATTCTAC
TACCCCTCAGGGAATGTTTACAGGCCCTCCCTCCCTACACATCAAGCTCGGGGAATTTGG
CCCTGCCCAGGACTGGCAAAATGACTTTACTCACATGCCCTGAGTCAGGAAATCAAAATA
CCTCTTGGTCTGGGTAGACACTGTCACTGGATGGGTAGAGGCTTTCCACAGGGTCTGA
GAAGGCCACTGCAGTCATTCTTCCCTCTGCTCAGACATAATCTTGGGTGGGCTTCC
CAGCTCTATACAGTCCAATAACGGAGCAGCCTTTATTAGTCAAAATCACTGAGCAGTTT
TCAGGCTCTTGGTATTGAGTGAACCTTCTGATCCCTTACTGCTCTCAATCTTTCAGGAAA
GGTAGAATGGACTAATGGTCTTTTAAAAACACACCCACCAAACTCAGCTCTCCAACTTAA
AAAGGAGGATAGAGCCCAAAACCTCGCAACCAAGCTAGTAATATTGCTGAACCCCTTGG
GCACTCTCTAATTGGATGTCTTAGGTCTCTCCAAATCTAGTCCTTTAATATCTGTTTTT
CTCCTTCTCTTATTGGACCTTGTGCTCTCGGTTAGTTTTCATTCATACAAAACCGC
ATCCAGGCCATCACAATCGTTCTATACAATAAATGCTCCTTCTAACAACCCACAAAT
GCGCCCTTACCACAAATCTTCCCTCAGCTTAATCTCTCCCACTCAGGTTCCCATGCGG
CCCATTAATCCCTCTCGAAGCAGCCCTGAGAAAATAGCCCATATTCTCTCCATACCAACC
CCAAATTTTTGCTGCCCAACACTTCAACATATTTTACATTATTTTCTTATTAATAT

FIGURE 22.2

53/64

AAGAAGACAGCAATGTCAGGCCTCTGAGCCCAAGCCATCATATCCCCCTGTGACCTGCACA
TATACATCCAGATGGCCTGAAGTAACTGAAGAATCACAAAAGAAGTGAAAAATGGCCTGTT
CCTGCCTTAACCGATGACATTCCACCACCTGTGATTGTTCCTGCCCCACCTTAAC TGAGC
AATTAACCTTTGGGAATTCCTTCTCCTGGCTCAAAAACCTCCCCCACTGAGCACCTTGTGA
CCCCTGCCCCCTCCACTACCCACCCAAATCCTATAAAATGGCCCCACCCCATCTCCCTTAG
CTGACTCCTTTTTTGGACTCAGCCCGCCTGCACCCAGGTGAAATAAACAGCCTTGTGTGCT
CACACAAAGCCTGTTTGGTGGACTCTCTTCACAGGGACGGGGGTGACAAACACCGGACA
CACATGGAGTGGTTTTAAGGAGCAGAGAGTTTAATACGCAAAAAGAAGGAAGAGGCTCC
CCTGTACAGACACAGAGGGAGGGGGCTCCAAGCCGAGAGAAGGAAACCCCATGTGCAGTG
GAAAAGTGGTGTATTATACTGGGAGGCTGGAGGAGGCGGTGTCTGATTGTCACAGGGCCC
AGGGGATTGGGTTGACCAGGTGTATCATTCATGTAACCCGCAAAAAACCTGGCCCTCCCA
CCTCAGCCCTTTAATATGCAAAATGTGGGTGCCATGATGTTCTGAAAACACATGAATTAT
CTGGAGGGGGCCATGACACTTGGTACATGTGCTGACAAGAAGAGGGTGGGAATCGCCATG
GTGGCCATGTTGGGTGGACCTAGTTTTTAATAGCCTGCATTTGCATATCAAAGTTTGCTG
GCCTGGCTCTTAAGCTGTCTTTTCTGTTAGAAAAGGAATGGTTTGGAAATGGGTGAGGGT
TGCTTCTTATTACAAGAAATTTCCAAAACCTTTACTCTTTCTAGCTGCCAAAACCTA
TTTCTTAATAACTTATGTATTACCATAATTAGGCAGCACCAAGATCCCTGCAGTGCAGA
CCACTGCAATTAAACATGCTGGCTTTACTGCTGATTATGGTAGCTGCATCCACCTAGCCTC
TCATATTGCAACTGCCTGACCTCTGCCACCCACGAGGCCACTTATCCCACTTATAATCA
GCCCATTTCGATTGTAACTCTGCCACTTATTCCGAGCTTGTGGTATATCCTATAGATG
AATTCATTCAACATCCATTCCAACACCACCTCTCTGCCTTCTATACTCTCTGGAGAGT
GAATTAAGTGCATGATCTTCACTGCAGTCATTTGTGGCTATGTGACATAGTTCTGG
ACAGTGAACATAGACAGAAGTCCCTGGGGCGGGCTTCTTTCTGGGATGAGGGCAAAACG

FIGURE 22.3

09719554-01501

54/64

GATCTCTTGATCCCAGGAGGCTCAAGGCTGCAATGAGCTAAGATCAAGCCACTGCATTCCA
 GCCTGAGTGATAGTGGGAGACCTTGCTCTTAAAAACACACACACACACACACACAGC
 AGGGCCTTTGACCACCTCTTGAGTAGAAGACTCGAGAAGAACAAGTAGAAGGCCAGAGAAA
 GAACAAAGTACTTTGAAAGATCTCTTATTAAGAGAAATGTACAGCTATGAAAAA
 AACACACACACACACAAACCTCATCTGGAATGAAAAAACATATGCATTGGTGTCTCT
 GGTTCCTTAGGCTGTTATGGAACAACCAAGAACATTATTTGGTTCTGAGGTCAGAAC
 TATTTTATCCCTCAAGCACATATGCTTATGGTTGAGGAGAGATGAGAAATAGGAAA
 CTAGAAACAGGCTGAATGGTCTAATCTTGACATCTAATCTGCAAGTCTTATCTTCA
 TTCTAAAGAGAAATGGTTATATTCGCTGTTCTAGCATAAAAAGTAAATGATAAAAAATAAA
 GATCCCGTATTACCAGACAATAATCCCTAGACTGTTTAAATGCTGGTGGAGTATTGCG
 TTATGATCTCAGACTTTAAAGATGGTCTCCCCCTATGGTGAAGCTTGTTAAATATGTAG
 GCATCATTAATGTCTGTTTACTTATCAAAATTTATCATCTGTTAGTGTATTACTACTTG
 ACAGTCCAAATTTATTTAATTGAAAAGATTGGTTAACTTTTATAGTCAAAATATTGTTT
 CCTGTGTTTTTCTGTTTATGGTTATTTGGATGATGAGTAAAGAAATACATACCAAGGGC
 ACACGTTTGGGACCCCTAATAGGTGAATCTACACCAATGACACAGTTCTCAAGAACGCC
 AACAGGAATATTTTGGAGGCTAAGTAAGGGAATTTCTTCAGACCCATTAAATGTTAG
 GAAAAAATGGAGCTAAAAGAGCTGGGTGGCTCACCTTTCTCATCCTGTGCTGAGAAATGC
 TGGGGCTCACCCATAAGTATCCAGCATCCCATGAGACAGGGGAATTCTGAACAAATGTG
 ATGAACCGATGAATGTCTGGCCTGTAGGTGGTTAGTGATGAGAGATACGGGCTATATGT
 GAATCTTGATTTTTGAATTCATAGAGCTTTGTAATGAAGGAAACAGTTTGTGCTGCTG
 CTTTAAGGATAGGTTTCATTGCAATTTCTCGCAGGAAAGTATGTAATGAGTTACCAAGCCT
 TAGATTTCAACCCCTTTTGATTCTTGCTGACTTAACTTTAAATGAATGGAAGAGTTATC
 ACAAAATGAATATCTTTTTTGGTTTTTTTTTTTTTTTGTAGATGGAGTCTCACTCTGTCCAG
 GCTGAGTGCAATGGCATGATCTCGGCTCACTGCAACCTCCGCTCCAGGTCTCAAGCAA
 TTGCTCTGCTCAGCCTCCGAGTAGCTGGGACTAAGGTGCGCGCCACCATGCCAGTTA
 ATTTTGTATTTTGTAGTAGACGGGGTTCCACTATGTGGCCATGATGGTCTCGATCTC
 TGACACTCGTATCCGCGCACCTTTGGCTCCCAAAGTGTGGAATACAGGCAAGAGCCA
 CCGCGCCACGCCAGGAATGACAAATGAATTACCTTATAAGTAATGCCATTAAAGGAAGGA
 TAGCTGGAAGATGGGTTGAGGGGAATGGAGGACCAAGAACCTAGTCCATTATTAATACAT
 GTGCATGTAATAATGATTTCCATTGACAAATAGGTTAATTTATCTCATAGCATAAAGGAAT
 GCTTAACAGTCATATGCAAGATGATAAGCTTTCTATAGCATCAACCAAAAGATCTAGC
 CAGTACAATTTCTTTGCTATATTTAGGGTTAGAAAGGCCCCAGAGGTGAACCAATTAGA
 TGGAATCTTGTAATAAACATCTGGATTAGCAGTGAACAGAAAAAGTCAAGATTGCTTTCC
 TTCTTCCCATAGATGTCTCAGGGATATTTAGTTTCTCAGAAAGATAAAGAAATTTAGTAG
 CGTTTTTTTGTGCATACTTACATGAATGTACATTATTTGAATTTCTTAAAGAGAAACAG
 CTGCATGATAACAAAAATTTGTGTTATGCTTGCTTTAGCTGGTATTTTTGCTTAGAACGAT
 TATATCGTTTCGGAACAAGAGCTATTCCTAAGAAACATATTTTAACTCCAGGAAGTTTTC
 CATTTTGAAGAAATTTATCTTACTATTTCCCAAGCAAAGAGGGGTAGTTACRGATTCACTA
 AGAATCATGTGCTCACAAATTTTATTTAATAATTAATCTCCTTAAATATATTAATCAC
 CTGACTTACAATGGTGGAAACCATGAGTGCAATTTTGGCTTTATTGTCTCAATAAGCTCTTCT
 CAGAAGTGAGCCACAAAGGTGCATAGTTCTTGGAGTTAAAGGCTCGAATTAAAGCAATCC
 CACTAAGGTCTCATTTAATGTGTGATTATTTGAGAAAAAGGCAAGAGTACCTAAGATCT
 CCCCCTCACTGCCAGTCCCTGTTTCATTAAAGATTAACCTGTAAGTAACTGAAAGGCT
 TTCTCTGGAGGAGTTTATTTGAATCAGTCTTTCACATGCAAGGATATGTAGTGAATCT
 CGTTTTTGTCTGGCAGGAATATGAACATCTGTTGTGAGGAAAGAAAAAGTTTCATGCAAT
 TACACTGCCAAAGAAAGGATGTTCAAGTTGAGAAACCAAGTGACATTTCTTGTAACGTGAC
 TATGAATCAGCGCATTTTAACTCTTAGATATATATGAGAGTCAGGAGGCTGGTAGGA
 AACGGTGTTCATTTTACATATGCGTTATTTTATCTGTGTGAGTGACTTCATGGCACCGCA
 TACTGCTGTTTTTAAATGAGGATACAGTAAATGCACTCGAGGCGAGGCTCACTGGAATCT
 AACATACCCGAGCTTTAGAAAGCAGTTTCCGACCCAGCGAAGAGTACAAAGCGATGGA
 ACCCATGTTCTGGAAGTTTGACATCTCAGAGTAAACAACTTGAAGAACCCCTCTTGATA

FIGURE 23.1

55/64

GCAGAATTCAACCAGCCTTGTTCATTTCTCTTAACAAAACACACCGCAAAAGCTCTCA
 CAAGCTGCTTTGATGAAGCCACATGATTTCCCCCTTCACAATTTACAGGAAGTACTCT
 TAAAGAAAGTGATTCTGTGTGTTTACGCCCTGTGTAAAGGGACAGAGTCTCTTTTATT
 TCTGATAACGTTTGAGCGAAATACAGAACTATCTGTAGACTAGCATAGTCGGTACGTGA
 GTAAGGAAAAGCAATAACCTGCTGTCCGGTGAGCACAATAATTCCTGCTACGAACAGTGCC
 TTACTGCTGCTTTGGAGACTGCAAGTCGAGATCACTAGGTATTGACTGATTGTATAG
 GAAATTTCTTAAAGTCTAAAGTAAAGGTGGTACCTCCTTAAAGAGGGGAAGAGAGAAAA
 CTTTGTGTGGGAAGGATAGGAGTGTGTTTATAGTTTCAGTAAGAGTGTACGTTTAAATTT
 TTCTTCTTCTCTGCCTCTTTCGCAAGTAGCCTGAGTGCATCTGTTTACAGAAAGTAGTA
 TTACTCTAGGACAACTTCAAATTTCTCATTTCTGCGTTGCTCTTAAAGGAACAACATCTT
 TCTTCTGTTTCTTTTTCCAAAACACACGCTTATGGCTCTGTGTGTGGTGTTTTAGCCAG
 CCTCTCTCCAGATAAGGGGTTCCCTTCCCTCCTTTTGCAATTGAAAGGAAAGTGCAAGTCTG
 GACATGTTTATCAAGAGGAAAAGTGACTTCTCAGTAATAGACTGTCAAATTCGGGCTGCT
 GCCCGAGTGTTCGCTTTGTTATGGCAGGTGAAGTTACACCTTTGCCCCACCCAGTGTTC
 ACAAAAAGGCAAGGTTCCAAGTATTCATATGAACAGTGTACTTTAGGACTTGGAGGTT
 TGGGGGTGGAGGATGTTTGTCATAGTTGAAGCCTTGGGCGGGGTGTAGGAAACGCCGAGT
 ACAGAGGCCATGAAAAAGCTAAGACTCAGTTTGACGTCGTGACGCCGCTTGGTCTCTCTA
 CCCAGTGACTCAAAGCACTAAAAGTCAGCATAAATCGGAACCTGAAGTCAGTAGCATCGCC
 AATTGGCATTCTACTCGAGTAGCAAAAGTAGTACTCTGTGGTGGGTTAATCGGTTTGGAGG
 AGCTCCTTAAATGAACATTTGTGTTTCATTTTCTGTTATTTTCCCGAACATGAAAAGAC
 GATAAACTGAAATGAAAAGGTAACAGCAAAAGTGTGCTTACCTGTTTCCGCCCTGTA
 TTCTTGCTGATTCAAGACTATTCTGGCTAACTGATTGGATTCTTTTCTAAGTACAGGAGC
 TAGGGGATCAGAAATCACACACGGTACCGGCTGTGTTTATTCTGAGAGGTGTGGGAGC
 TTTGGGTCTGACTTCTTTTACATGCTGTCTTCTCTTTTGGACAGATCTATTCCAGAGG
 GGAGCTTCCACCTTCTATTGACGGCTTTAATGAAGAGAAAAGCAGCTGGATCGCTGATGT
GRATCCAGCACACTCTCCCGGAGCAAAACCTGGCTCGCTGTGAGAACGGGATGAACAT
CTACTTCTACCCATTAAAGCCCATCCCTGCAACCCAGGAACCTCTTGTGTGTTATGTGTC
GGACTTTGCAGAAAGGCTTCACTACCTTTATCCCGGAGAGCTGACCAATGATGAATCTCAG
 TAAGTGGATTACAGAAACAAAAATAAAAAATGCCAGTAATGTCGGTTCTGCCCTTTTGA
 ACTAATAACATGTTGTTTAAATATACGGCTTTGTCTATGTTGGATGAAGTAGGTGGCTT
 AAGCTAGGAGTACAGGAAGGAAAAACATTTTGTAGTCCCTAATTAACATATTAGGAACAT
 TGATCTTTTAAAGTATATATATATATAGGAGGCTACCTTTGAGTTTGAATTCAGGATGT
 TACAGGAAGAAATATATGTCCAATTCTAATTTATCCAAAAGCAGTTGGGAGAATTACAGG
 GATTGGTCCAGACATGCTGCGTATGCAAGGTATAGCCCTCATCTGTGGTACTTTGGCAGG
 GCTTAGACTGCATCAAAATATTTATAGATGTACATTTGAGTGTACAGTTAGGATCTGATG
 TGGACATATTGTAAGATCATTTGCTAGAAAACTTTGTCTAATAATTTTCAATATTATTCTAA
 GTGAATAACCGTAAAGATTTTACATCTTAGCTTCCCTCCTTACAGTAAAAAATCTG
 ATCTCTTGATCAGTATTATAGTAGCCACCTATCACTTTATCTTAAACAAATTTCTCAATTC
 TAGGTTTATGTGCTTTTACTTCTTTATTGTTAATAAATGTGCTGATGACCTCTCTCT
 GCAGAGGGCTGCATCATTTTGGTCATCTCAAGTGATCTCTTGGACAAATTAAGAAATTG
 CCATAAGATTTCTAACCTCTGCTGTAACATATGTTGTGTGTTCTTGGTTAGACCACTAAAT
 CTATTATGACAGTTTAAAAATTTATCTCTTTTGGTTTGAAGTTAAGACTAAATGCTGAAG
 TTTTGTAACTTTTGGTTTGTATATCTTCAAACTTAAGAAAAACATTTGAAGAAAAGGA
 CAAAGAATTTCCACTTACCTTTACCCAGGTTTACCAAGTTATTGATAAGTATATCCAATT
 GCTTTTACCAAGAGGCTAACCTTGTGTTTATGTTTCACTTTTACCTTTGAGACATTTGAAGATA
 AATATCAATGTTAAACATAAATTTGGAATTTTGACTTTGATTTTAGGACCAATGAACAGGCC
 AAGTACTTACCCTAGTCATATATAATCCAACCTGTATGGTTATTGTTGATTTCACTTCCACAC
 TTCATTTTACTTGATCTCCCTTAAGATTGAAGATTTGTGTTTGCAGTTTCTTCTGAAAATCT
 TGGGCTATAAAGCATCAGACCTCCCCCTAGGGGAGGTGCTGTGTTTGGGGTCCCTTA
 CCAACAGGTTTACCCTTGAGCTTCAGGAAAAAGAACCTGCTCTCAGTTCCCCAGTTCCAGC
 TTAATGGGTCTAATTAGGTCTGACCAAAAAGGTGGCAGTTCTTTTCCCTCATGCTCTCT
 CAGCCCTCCCGAGACTCTGGAGACTCTGTCTATATCCCTAGGCTGAGCTGAGCCGAGAAC
 CATTGCGCTGTGTGGCATCTGTGTATGCCATGCCAGTGTCTGAGGACCTAGTAAACAAAC

FIGURE 23.2

56/64

GACAAATGCACAGGCACAGTGGCATTTTTGTGGAACCTCGTATTCAGCTGTGCGTCTCAG
 AAGAAGCGCACAGCTCCCTCCTGGCTTTCTTAACATAGTAGGCCACTTCCACTTAAGGGT
 CTCCTTACATTCTCTGAGTTTAAATCATTATGAGTTCAGAGGAAGTCTTTTGATTTTTG
 CTTTTCTTTAAACAGTTCATTTGAGGTGACCTACCCAGTGACTTTGCACCAACACCCAA
 GAAACTGTTTTGCATGCTCCCGCACCCTGTGCCAATCAAGGGAAGGGTTTAAAGGGCTG
 CGGTTTTTATTTCTCAAAGAAAGGTTTTGCACAGTATTTTAAAGGTTCAAGTGCTTCTACT
 TTGTGTTTCAGAAGCAACTGTGCATATATCTGTGAATGACACCTTTTATTTATCTCCCTTT
 TATTTATGTCAGTATGCTCCCTTTTATTTTGGCAGAAATTTTTCTAAAGTGTGGTTTAA
 TTTTCAAAGCACATTTCTGTTCCAAATATTCTATGTAAGATAGAGTATTAACATTAACCA
 GTCACATTAACCAAGATTTCTGCTGCCAGTTGTGAAACCGGTTGTCTTAGCGCTGGCAG
 CTGATGATTGAGACTGTGATCAGGAAATTTCCACTATTTTCATCAGGCCTAATAGGTAGA
 TTGTGCTCTCAAATGAAGTGTGTTGGGTTTCCATGCTTAAAGCACAATAGAGGTGGTGA
 AGAATCTCCATGAGGGCTTAAATGGCAGTGTGTTGAGGCGTAGAGTTTGGAGAAAGAA
 GGGATTTGAAACAAACCAAGGAAAGAAAGTAAGTAGCCAGAAATCACAAATGGCATT
 TTTCTAAACCAAGGAAAGGAATAAAGAACTAATAGTTTGAACCCCTACCCCTGAC
 CAAATTTGGCAGGGGGAGGTATTTTTTTCTATCTCTAACTAACCCATCACACCA
 CAGTTGACCATAATATAGACTTCTAAATGTTAACTGCTTTCTCAGTTTCAGTTGAAAG
 AGACTTTGTTTGGCTACTGCAGAACTCTCAGGTTCTTTCTATAGTCTTGGGGTCTCTTA
 TATAGATCGAAATGTGAGTCGGCATAATTAAGCATTGGAGTCTTCAGAAAGCAGTCTC
 ACTCTTGAATGACTCCGCTCGGCTACAGCCATTAAAGATTTTCAAAGCAAAACAGATCT
 TGATTTTCTTTTTCATGTTAACTCAAGCTGTGCTGAGTGGGAGTGCAGAAATGACACC
 AGCTCCACTGATTACTCAGCTGCTGAAGGATGATTTTTTAAATGCACCTTTACTGTATA
 TGGACTTCCATAATTTCCACCTGTAGAGCATCTTAGGGAGCTAACATGTCACTCTGGATG
 TCTTTTTAGAATAAGATGCAAACTATTTTTCTGAAGGCATTAGAGATAGCAACATTTA
 TTGTGAGTTTACTATATACATAGGCATCTGTCTAAGTGTTTTGATGAAGAGTTTAAATTT
 CTGGCTTTTTTGTGGCCCAATCATAAAGTTTCAATCAGTTCAACATTCAAAATTAATTA
 AGGTACTTAAGAAGATCCCTGGCTAAATGTGAGGGGCGAGTGCCACAGATGGACTGAAAC
 TTTATGCTTATTGACATTTATGCTATTATTTTGTGAATATAGAACCAAGGGAGTG
 TGGAAAGCACTGGAAAAAATATGAGACTTAGATACATTAATTGAGTAAAAATGGCTCAAA
 GTCATGAGGGTAAAGTTTTTTGTATTTCCATTTTATTGAGCGGCATCGTTTTTAAAAAT
 CATATGAATTTGACCCATATAGATGTTTCAAATAATCTTTTTTACCTTCATAAAAT
 TCCTTCCTGTGGCTGTGAGATGCTTGGCTATCAGTTTTCAAGCTTAGTGTCTTTCTCA
 TCCTTTACCAATTTAGCTTTAAAAAACAAAAGTGACAATTAGAACTCTCTGCTGCTGGG
 CCTCACTGAAAGACCGATATTGGCCTGATAAGGAGATATTATTTTGTTTTAGTGGCTTC
 AGAAATCCCTCTCCCTCAGCAAGCTTTCCATCACGGGCCCCCGTCAGCATCTTCCCTGA
 TAGCGTTCTCTCTGTGTATTATTCTGGGGCTTCAGGCTCGCCAGGAGGAACGTGATAAAC
 GCTGGCAGGAGATAACATTTCTTAAGGGGCTCTCAAATGGAATCGAATCCCTCAAGCCA
 CTCAGGCTAGAGAATACATTTAAAGGGTTTCAGTTCTGGAGTTTTCACAGAGTTCTAGTTCTA
 GACCTATCAGATAGCAAGTGTGGAGTTCTTTCTCAACTAAATTAAGCAGAGACATTTTT
 TAGACGATGAAGGATATTGCAACAAAGGCTTCAGCATGATCCCCCAACCTGTGCTGCTG
 GAAGGCATCTCCACACATTGACAGCCAAATGCCCTTCAGTGGCTTCTTAGGGCAGGTGTCT
 GGCCTGAGTGACTGTCTCCCAATATCAGAGCTCAAACATAACATGATGTGTTTACTGTT
 TGGTTTCCAGGCAGGCTGAGCAGGAAATTTTCAGTTTTCCTGTCACAGATGGGTGTTTT
 TTCTGGAAGGCATCATTATTGTGTAGCGAGGAGACAGGGCTGGCTGTGCGAGGATAGT
 CTAGAATCTTCCCTATTGCTGCTGTCTCTAAATAGTATTTTACCAAGTAATAAGCTGGC
 GCTCTTGGGAATAAGTGCTTTCTCTTAGCCTGTCTGTTTTCTTGGGTGCGCTAAGTAA
 TTGAAGCTGGCTCAGGAAGTACCTATTGTGGTTTGGCAGAGGTGACTGTCAAGCTGTGA
 CTCAGGGGCCAGCATGCTGGGATCTGGCTAGACAGACAGAGCCTTGGTGAAGTGTG
 TAGGCTGTCTGCACATCGCAGGAAGGTGGTATTCACTTCGCTAAGCTCCTTGGCATAGG
 CAGTTTGAACAGGGCTTTATCAAAATCGTATTCAACAAGAGTAGAAGCGAAATGATGA
 CTGTGTATTACTTGAATGAGTCTTAATCTTTCACATTTAGTTCTCAGGCTATGCTGATT
 TCCTTTAGGTAAACCATGAACATCAGAAAGACTTTTAACTATGACAGGGTCCACAC

FIGURE 23.3

57/64

CCCCAGTATTTTTCCACTCCATTAATAATGGAAGTTTTTTTTTTTTTTTTTCTTTTGTGAGAC
 AGAGTTTTTGTCTTGTGTGCCAGTCTGGAGTGCATGGCACAACTCGGCTCACCACAAC
 CTCACCTCCAGGATTCAAGCGATTCTTCTGCGCTCAGCCTCCCAAGTAGCTGGGATTACA
 GGTGTGCGCCACCAAGCCAGCTAATTTTGTATTTTTAGTAGAGATGGGGTTTCTCCATG
 TTGCTCAGGCTGGTCTCGAACTTCGACCTCAGGTGATCCGCCACCTCGGGCTCCCAAA
 GTGCTGGGATTACAGGCAAGAGCACTGCATCCAGCTTAGGCTATCTTACTCTCAGCCTAA
 ACAGCAATTTTCTATCATAGGCTCTGTACTAATGAAAAACAGAATCACCCRAAGGCTGCTGT
 TTGTTCTGTCTGTGCTGCCATTGTCCGCAATTTTGTCTGAGGAGGAAACGGAACGTGCATTT
 TGAGTAGGTGGGCCAGAGCCTTCTAGAATGAGAGTGCCTTGGAAAGCAGATATGTGGGCA
 TTGTGTCCAGCTGTATTACTCAGGTTTTCTCAAGAAGGAGGAGCAACTTTGGCAGATTGTG
 CTTCAAGTTCTCTCTAGCCCTCTGTGTAAATCGCCCTTTTCTTTATTTTACGACAAACAC
 AGAGCAGTCTAAAGCAACCGAGCACTGAGAAAAATGAACCTCTGCCAAAGATATGCCAAC
 AGAGAGAGTACAGCGTGAAGAAATCTTAAATTTGGACTCCCAACCTCCAAAGGAAAGG
 ACCTCTACCGTTCTTAACATTTTCAACCCCTCACATCAGAAAGGACCTCGATGACTTTAGAA
 GAGCTGGGAGCCCCGAATGCCCTTCTACCTCGGGTCGTTTACCCCATCCGGGCCCTCT
 TGCCAGAGACTTTTGAAGCTTCCCTGGCCTACGGGATCGAGAGACCCACGTATCATCA
 CTGCTCTCCCATCTCCATCTCCACCACTCCAAGCCCCCTCTGCAAGAGCAGCCCCGACC
 AAAGCTCTAAGAGCTCCAGCCCTCACAGCAGCCCTGGGAATCGGGTGTCCCTGTGGGCC
 CCGGCTCTAAGAGCACCAGGACTCTCTACGCTTACTTGAACGGCTCTACAGCCAGCGAAG
 GTTTGGGCTCTTACCTGGCTACGCAACCCCTGCCCCACCTCCCGCGAGCTTTTCATCCCTCT
 CGTACACGCTCTACTACCCCAAGTTCTCTTGGCCCCCTACGGCATGAATTTGAATGGCC
 TGAGCGCTGTGAGCAGCATGAATGGCATCAACAACTTTTGGCCCTCTCCCGAGGCTGTGCC
 CTGTCTACAGCAATCTCTCTGGTGGGGGCGAGCTGCCACCCCATGCTCAACCCCACTT
 CTCTCCCGAGCTCGCTGCCCTCAGATGGAGCCCGGAGGTTGCTCTACGCGGAGCATCCCA
 GGGAGGTGCTTTTCCCGCGCCCCCAGTCAGTCTCTCTTTTACCGGGGCCCGCCAGCA
 TGAAGGACAGGCCCTGTAGCCCCCAAGCGGGTCTCCCAAGCGGGGAACAGCCGCCACGG
 CAGAACATGTGGTGACGCCCAAGCTTACTCAGCAGCGATGGCAGCCCCCAGCAGCGGAG
 AAGCCATGAATCTCATTAABAAACAAAGAAACATGACCGGCTCAAGACCCCTTCCCTACC
 CGCTGAAGAAGCAGAACGGCAAGATCAAGTACGAATGCACGTTTTCGCCAAGACTTTGG
 GCCAGCTCTCCAATCTGAAGGTAGGCCCTTGAGAGAGAGCAGTCCAAGGGGCTGTAGTGC
 ATGCTTGTGTTTGTATTAGCTTGCTTTCCATGGGGTATCGATTGCATTTGCAATAGTAT
 GAGCCCCCGTTGGGATAGTGGGTATGGATTCCGCCCTGGCTTTTGCCACTTCTAGCTCT
 TTGACTTTGGCAAGTGACTTCCCTTCTCTGATTTTCTCTGAATAAATAAAAAATAG
 GGGTTTGGACTAGAAGATTAGGTGAAACTCCCTGCTAGCCTGTGATTTTGTGCTTTTAA
 GAAAAACACCATCTCGAAACATGAAGATTCTTCTTTTTAAGACTGTCTTGATGCTTTT
 CTTAAGATATTTGCATCAACACTTGAGTCTTGGAGCAAGAATGTTAGGTCTCAGAGCCAG
 CTTGAGAGCAGAGCTAACACATGTGGCTTCTTCCAGGTCACCTGAGAGTGCACAGTGG
 AGAACGSCCTTTCAATGTGAGACTTGCAACAGGGCTTTACTCAGCTCGGCCACCTGCA
 GAAACACTAGTCTGTACACAGGGAGAAAGCCACATGAATGCGAGGTGCGCAGTATTTT
 CTGGGTAGACCTTCTGACCTTTGTAGAAAAATGCTGTGAGTACCCTCCATGTCTATTA
 TAGCCCGTAGTTAAAGCAACACCAAGATCTGCGTTGCTCCATCCTGGACTGATGGCACT
 ATGCTCTTCCCACTTCTGTATCTGTGATGACTTTGAGATGGCAGCAGCCAGCTCTCAG
 TGGGTGGGAAATGGTAGGGGAAATAAACAGCCCTCTGTGCTGTGTGCCCCACATCCCC
 CCGTTTCTGCTTAATCCACACTGGAGGTGCCAAGGAGGCTTCTACCTCTCTAGGTGCT
 GGGCGTTGGCCGGTAAGCTGCCCTCCGCTTGGCAACTCTTAATCTTCTGGCCTTCTGT
 TCTCCCTTCCCTGCTGTCTCTCCCCCTACACTGTAGGCTGCCACAAGAGATTTAGCAG
 CACAGCAATCTCAAGACCCACCTGCGACTCCATTCTGGAGAGAAACCATCAATGCA
 GGTGTGGCTTGCACAGTTTCAACCGTTTGTGCACTGAAACTGCACAGCGCTGTGCACAC
 CGGGAGCGGCCCCACAGTGTCTCCAGTGCACAGAACTACATCTCATCTGTGTAGCCT
 CAAGGTTACCTGAAAGGGAAGTCTGCGTGGCGCCCCGGCCTGGGGTGCCTCTGGAGA
 TCTGACCCGAATCAATGAAGAAATCGAGAAGTTTGACATCAGTGACATGCTGACCCGCT
 CGAGGAGCTGGAGGATGACATCAGGTGTGATCTCTGTAGTGGAGAGGAAATCTGGCCGT

FIGURE 23.4

1. **Introduction**
 2. **Background**
 3. **Methodology**
 4. **Results**
 5. **Discussion**
 6. **Conclusion**
 7. **References**
 8. **Appendix**
 9. **Index**
 10. **Table of Contents**
 11. **Abstract**
 12. **Summary**
 13. **Key Words**
 14. **Keywords**
 15. **Subject Headings**
 16. **MeSH**
 17. **Indexing**
 18. **Classification**
 19. **Numbering**
 20. **Ordering**
 21. **Grouping**
 22. **Labeling**
 23. **Marking**
 24. **Notation**
 25. **Symbolism**
 26. **Diagramming**
 27. **Flowcharting**
 28. **Mapping**
 29. **Charting**
 30. **Graphing**
 31. **Tablemaking**
 32. **Formmaking**
 33. **Diagraming**
 34. **Flowcharting**
 35. **Mapping**
 36. **Charting**
 37. **Graphing**
 38. **Tablemaking**
 39. **Formmaking**
 40. **Diagraming**
 41. **Flowcharting**
 42. **Mapping**
 43. **Charting**
 44. **Graphing**
 45. **Tablemaking**
 46. **Formmaking**
 47. **Diagraming**
 48. **Flowcharting**
 49. **Mapping**
 50. **Charting**
 51. **Graphing**
 52. **Tablemaking**
 53. **Formmaking**
 54. **Diagraming**
 55. **Flowcharting**
 56. **Mapping**
 57. **Charting**
 58. **Graphing**
 59. **Tablemaking**
 60. **Formmaking**
 61. **Diagraming**
 62. **Flowcharting**
 63. **Mapping**
 64. **Charting**
 65. **Graphing**
 66. **Tablemaking**
 67. **Formmaking**
 68. **Diagraming**
 69. **Flowcharting**
 70. **Mapping**
 71. **Charting**
 72. **Graphing**
 73. **Tablemaking**
 74. **Formmaking**
 75. **Diagraming**
 76. **Flowcharting**
 77. **Mapping**
 78. **Charting**
 79. **Graphing**
 80. **Tablemaking**
 81. **Formmaking**
 82. **Diagraming**
 83. **Flowcharting**
 84. **Mapping**
 85. **Charting**
 86. **Graphing**
 87. **Tablemaking**
 88. **Formmaking**
 89. **Diagraming**
 90. **Flowcharting**
 91. **Mapping**
 92. **Charting**
 93. **Graphing**
 94. **Tablemaking**
 95. **Formmaking**
 96. **Diagraming**
 97. **Flowcharting**
 98. **Mapping**
 99. **Charting**
 100. **Graphing**
 101. **Tablemaking**
 102. **Formmaking**
 103. **Diagraming**
 104. **Flowcharting**
 105. **Mapping**
 106. **Charting**
 107. **Graphing**
 108. **Tablemaking**
 109. **Formmaking**
 110. **Diagraming**
 111. **Flowcharting**
 112. **Mapping**
 113. **Charting**
 114. **Graphing**
 115. **Tablemaking**
 116. **Formmaking**
 117. **Diagraming**
 118. **Flowcharting**
 119. **Mapping**
 120. **Charting**
 121. **Graphing**
 122. **Tablemaking**
 123. **Formmaking**
 124. **Diagraming**
 125. **Flowcharting**
 126. **Mapping**
 127. **Charting**
 128. **Graphing**
 129. **Tablemaking**
 130. **Formmaking**
 131. **Diagraming**
 132. **Flowcharting**
 133. **Mapping**
 134. **Charting**
 135. **Graphing**
 136. **Tablemaking**
 137. **Formmaking**
 138. **Diagraming**
 139. **Flowcharting**
 140. **Mapping**
 141. **Charting**
 142. **Graphing**
 143. **Tablemaking**
 144. **Formmaking**
 145. **Diagraming**
 146. **Flowcharting**
 147. **Mapping**
 148. **Charting**
 149. **Graphing**
 150. **Tablemaking**
 151. **Formmaking**
 152. **Diagraming**
 153. **Flowcharting**
 154. **Mapping**
 155. **Charting**
 156. **Graphing**
 157. **Tablemaking**
 158. **Formmaking**
 159. **Diagraming**
 160. **Flowcharting**
 161. **Mapping**
 162. **Charting**
 163. **Graphing**
 164. **Tablemaking**
 165. **Formmaking**
 166. **Diagraming**
 167. **Flowcharting**
 168. **Mapping**
 169. **Charting**
 170. **Graphing**
 171. **Tablemaking**
 172. **Formmaking**
 173. **Diagraming**
 174. **Flowcharting**
 175. **Mapping**
 176. **Charting**
 177. **Graphing**
 178. **Tablemaking**
 179. **Formmaking**
 180. **Diagraming**
 181. **Flowcharting**
 182. **Mapping**
 183. **Charting**
 184. **Graphing**
 185. **Tablemaking**
 186. **Formmaking**
 187. **Diagraming**
 188. **Flowcharting**
 189. **Mapping**
 190. **Charting**
 191. **Graphing**
 192. **Tablemaking**
 193. **Formmaking**
 194. **Diagraming**
 195. **Flowcharting**
 196. **Mapping**
 197. **Charting**
 198. **Graphing**
 199. **Tablemaking**
 200. **Formmaking**
 201. **Diagraming**
 202. **Flowcharting**
 203. **Mapping**
 204. **Charting**
 205. **Graphing**
 206. **Tablemaking**
 207. **Formmaking**
 208. **Diagraming**
 209. **Flowcharting**
 210. **Mapping**
 211. **Charting**
 212. **Graphing**
 213. **Tablemaking**
 214. **Formmaking**
 215. **Diagraming**
 216. **Flowcharting**
 217. **Mapping**
 218. **Charting**
 219. **Graphing**
 220. **Tablemaking**
 221. **Formmaking**
 222. **Diagraming**
 223. **Flowcharting**
 224. **Mapping**
 225. **Charting**
 226. **Graphing**
 227. **Tablemaking**
 228. **Formmaking**
 229. **Diagraming**
 230. **Flowcharting**
 231. **Mapping**
 232. **Charting**
 233. **Graphing**
 234. **Tablemaking**
 235. **Formmaking**
 236. **Diagraming**
 237. **Flowcharting**
 238. **Mapping**
 239. **Charting**
 240. **Graphing**
 241. **Tablemaking**
 242. **Formmaking**
 243. **Diagraming**
 244. **Flowcharting**
 245. **Mapping**
 246. **Charting**
 247. **Graphing**
 248. **Tablemaking**

FIGURE 23.5

09/7/1955

WO 99/67395

PCT/FR99/01513

59/64

GTCTGGACTTGTGGTGGCTGCCAGGGATCCGCAGCGTTGCGGGTTGTATTCGCTGGATACCAAGAGGGCG
 GAAGTGCAGCAGGGTTCACTCCGACCTCCGCGCGGGTCTTTTTCGCGCTGCGCGGGCTTCTCTGGAGATC
 CTGCTACCGCTCCCGCAGGACAGTGTGTGAGCGGGCAGCTTGCCCGCGCGCCACCGGAGCGCGGA
 ATCTGGGCGTCCCCACCAGTGCGGGGAGCCGGAAGGAGGAGCCATAGCTTGGAGTAGGTTTGGCTTTGGT
 TGAATAAGAAATTTAGCTCTGTATGTACTGCTTTAACTCCTGGAAGAATGCAGAGATGACAAAGATGTGCTT
 CGAGATGTGTGGTTTGGACGAATTCCAACTGTTTTCAGCTATATCAGGATGAGATAACTGAAAGGGGAG
 CAGAAACCATCATATTGCTTTTGCCAAAGATTAAGTTATTGAAGTTGGTAATGCAGAAAGTGAAAAGACA
 CTTTCAGAAAGTTATGAGACAAGAAGACATTAGTAGATATGGTTTGAATATGAAGGCACACCACTGAAA
 TGGCATTATCCAATTTGGTTTGTCTATTGATCTTCTTGATCAAGTTTCAGCTCTTCTCTTGGAACTACAG
 TACATTTTAAAGTGTTCCTCAGAAAAAGACCTTCTGCACTGTCATCTAAGGATGCAATTGGAAGCTCAAT
 TATGTCACTGTATGAAGAAGCTGATGCTTTTAAACATAAAAGTCAAGTAATCAATGAATTCAGGAAAAA
 GATCACAGCAACACTCTGATGGGATGCAAAATGACAGATTGACCAGTTTGGGCGCATCAATCGGAAAC
 TCATGGAATATCTCGCAGAAGAAAAATGGATTTCGTTATATATCCCTTTAGAAATATATCAGACAACGATGA
 AAGACCTTTTATTCAGAAAGCTGTTTCGTCCTGTGGCTGCAGATGGACAGTTGCACACACTAGGAGATCTC
 CTCRAAGAAAGTTTGTCTTCTGCTATTGATCTGAAGATGGGGAAAAAAGAAATCAAGTGATGATTCATG
 GAAATTGAGCCAAATGTTGGAAACACCTCTGCAGTGGCTGAGTGAACATCTGAGCTACCCGGATAATTTTCT
 TCATATTAGTATCATCCACAGCCAAAGATGAAGGATCACTATTGCTGAACAGAAATCATCTCTTAA
 ATGGGATTTATCAGAGCATGTCACTCTTTGCTTCAATCAGTTTGGTGAGGCAACTCTGACCGAAACA
 CTTGCGCTGCGAAGCAGACAGAAAAAGATTTCATGTCAATGAAGCAATGGGCTGGTCTTACTTTTG
 CATCACTCTGCTTTTCTCCACTGSCATCAATTAACCTCAGCTGTGACATGAAAGACTTACCGGACCACT
 GAAGGTCTTCTGTAATAATATAATGAAGCTGAAACCTTTGGCTTAAGAAGAAAAATGGAAGTATGTGGCACT
 CGATTTGTATTTCTGATTAAACAAATAAACAGGGGATTTTCTAAGGTGACCATGGTTGAACTTTAGCTCA
 TGAAGTGGAAACATTTGGTTTAAATTTCAAGAGAAATGAAGAAAGTAAAGAGAAATTCCTGTATCAATAA
 CTTGCAAGTAATTTTTGTAAAGATTGAATTAACAGTAAACCCATCTTCTTAAACGAAAAATTTCTCATG
 TTTACAGTCTGTCTATTGGTATGCAATCTGTAACTTTGATAATGAACAGTGAAGATTTTAAATAAAG
 CCTCTAAATATGTTTTGTCAATTTAATAACATACAGTTTGTCACTTTTCAAGTACTTTCTGACTACATA
 CAGTAGATCACTTTTACTCTGTGTTACCATTTTGACTGCTGATTTGGCATGGGGTGGATATAGGGCA
 TAGGATTACTTGCTCAGAAGCTGTATAGAATTTCTGCTGCCAATTAAGAAACCTGTGTTCTTACAC
 ACTACAGTATAAAATATTGTAAGTGTTCATCTTTGTTGTTTTATCACTGTAAAGCCTGTCAAAATCATAGTA
 TCCTAAGCATCTGTAATGCTAATTTTGCAATTTTGAAAAAACCCATTCCTTCCAAGCTAGTGTTTTTC
 TTGGCTCCAGGTCTAATTTTTCACGTGGTCCCTGGCAGCCAGTCTTTTGAAGTTTAAAGATTACCTGT
 TCTTGAGCTGAGTACCTTTTCTTAAATTTTACCAAAAAATATCCAGAGGTTACTGGAGTTCTTATTCAAT
 ATAAGGAAGTTTGTGTCACCTTTATTACCAAGCCTCTGGGATTTTACAGTCAACCAATTTTGTGCAITTA
 CATTTCAATTTCTGTGAGCTAGCTGGCTGTCCATATTGAATGTGAACCCATTGAGTACGCTAAAAGGCT
 TACAGTATCAGACAGCATCATGGTTTTAGATCCCATATAAAAAATGATGTTTTCCTATAAAAAATTTAT
 ACAAAATGCTGAAGTGAGATTCTACTATTGTTTATGCTCTCTCTTTCTTTCTTTCTTTTGGCATTTCTGCT
 ATTAAATAGCATTCTTTCACAAAATTAGATAAAGTTGGTCAAAGCCAGATATTCTGGAAATGGAAATTTG
 TAAAGCTTTAATCAAAAAGAATAGCCAGTACAGCATACAATCTCAGAACTTAGAAGCAAGTAGAAAAATTA
 TTGGTTGATGTAAACGAAAGTGCCATTTTATGAAGGCGAGGAAAAATAGCAATATTGAGTTATGTAA
 GGATAAAAAATCCACTGACTGTATTTTGTCAAGAGGCTGGTCTGAATATGATTGTTTCACATTAAGT
 GTTTTATTGTCGCTGATTTTGGGGATTTTCCCTCTGATGTTTGTAGCAGATTGAAGTGAGCTTTAGTG
 AGCAAAAGAGTCAAGATGCAGGGAACACTAAGCTGTGATGAAGAAGTTGGTAAAGGCAAGAGTAGTT
 TTATACAGACAAAACAGGTGTCAGGCGCTTTGCAAGTGGCTGAGTGAACTTCTGATCTAGATTGAAAGT
 AAAATTTATGAAGACATTGCCCCATTTTACTTCTCATTCATTATTGTACAGCATCATAGCTTTATTAC
 TCTAATCCAGGTAAAGTCAAGCTACAATGCCATAGGAGGAAGAGTAAACAGAAATTCATGCTGGCTTAA
 AATAATCTATTTTGTGTTCTTTTTCATTGTAATATTAAATTTATGGTTTATTAAGAAATTAATAAAAA
 AGAAAAA

FIGURE 24

GAATTCCGGGAAGCCAGACAGCGTTTAAACACAGACAAAGTGCTGCCGTGACACTCGGGCCCTCCAGTGTTCGGG
 AGAGGCAAGAGCAGCGACCGCGCACCTGTCCGCCCGGAGCTGGGACGCGCGCCGGCGCGGACGAAG
 CGAGGAGGGACGCCCGAGGCTGCCCCAAGTGTAATCTCAGCACTGTGAGGTTTCAGGAGTTGGCAGAGG
 GGACCAAGGGGACATGAAATGGACATGGAGGATCGGATATGACTCTGTGGACAGAGCCGTGAGTTTGA
 GAGAAGTTGACATACATTGTGAACGACCACCCCTGGGATTCTGGTGTGATGGCGGTACTTCGGTTCAGG
 CGGAGGCATCCTTACCAAGGAATCTGCTTTTCAAGTATGCCACCAACAGTGAAGAGGTTATTGGAGTGAT
 GAGTAAAGAAATACATACCAAGGGCACACGTTTGGACCCCTAATAGGTGAATCTACACCAATGACACA
 GTTCTTCAAGAGCGCCCAACAGGAATAATTTTGGAGGATCTATTTCAGAGGGAGGCTTTCACCACTTCATTG
 ACGGCTTTTAAGAGAGAGAAAAGCAACTGGATGCGCTATGTGAATCCAGCACACTCTCCCGGGAGACAAA
 CCTGGCTGCGGTGAGAACGGGATGAACATCTACTTCTACACCATTAAGCCCATCTCTGCCAACAGGAA
 CTTCTGTGTGGTATTTCTGGGACTTTGCAGAAAGGCTTCACTACCTTTATCCGGAGAGCTGACAAATGA
 TGAATCTCACACAAACACAGAGCAGTCTAAAGCAACCGAGCACTGAGAAAAATGAACCTTGCCCAAGAA
 TGTCCTCAAGAGAGAGTACAGCGTGAAGAAATCCTAAAATTGGACTCAACCCCTCCAAAGGAAAGGAC
 CTCTACCGTTCTAATCTTTACCCCTCACATCAGAAAGGACCTTCGATGACTTTAGAAGACGTGGGAGCC
 CCGAAATGCCCTTCTACCTCTCGGGTCTTTTACCCCATCCGGGCCCCCTCTGCGCAGAAAGACTTTTGAAGG
 TTCCTTGGCCCTACGGGATCGAGAGACCCACGTACATCACTCGCTCCCCATTTCATCTCCACCACTCCA
 AGCCCTCTGCAAGAGCAGCCCCGACCAAAAGCCTCAAGAGCTCCAGCCCTCAGCAGCCCTGCGGAATA
 CGGTGTCCCTGTGGGCCCCGGCTCTCAAGAGCACCGGGACTCTACGCTTACTTGAACGCGCTGCTACGG
 CACGGAAGGTTTGGGCTCTTACCTGGCTACGACCCCTTGCCCCACTCCCGCCAGCTTTCATCCCTCG
 TACAACGCTCACTACCCCAAGTTCCTCTTGCCCCCTTACGGCATGAATTTGTAATGGCCTGAGCGCTGTGA
 GCAGCATGAATGGCATCAACACTTTGGCCCTCTTCCGAGGCTGTGCCCTGTCTACAGCAATCTCTCTGG
 TGGGGCAGCGCTGCCTCACCCCATGTCTCAACCCCACTTTCTCTCCGAGCTCGCTGCCCTCAGATCGAGCC
 CGAGGTTGCTCCAGCCGGAGCATCCAGGGAGGTTGCTGTGCCGGCGCCCCCAGTGGCTTCTCTTTTA
 CCGGGCTCCCGCAGCATGAAGGACAGGCCCTGTAGCCCCACAAAGCGGCTTCCCAAGCGGGAAGAGC
 CGCCACGGCAGAACATGTGGTGCAGCCCAAGCTTACCTCAGCAGCGATGGCAGCCCCAGCAGCAGCAAA
 GCCATGAATCTCATTAAAAACAAAGAAACATGACGGGCTACAAGACCCCTTCCCTACCCGCTGAAGAAGC
 AGAACGGCAAGATCAAGTACGAATGCAACGTTTGGCCGAGACTTTGGCCGAGCTTCCCAATCTGAAGGT
 CCACCTTGAGAGTGTCACAGTGGAGAACCGGCTTTCAATGTGAGACTTGAACAGGGCTTTTACTCAGCTC
 GCCCACCTGCAGAAACACTACTCTGGTACACAGCGGAGAAAAGCCACATGAATGGCAGGCTCTGCCACAAGA
 GATTTAGCAGCACCAGCAATCTCAAGACCCACCTGCGACTTCCATTCTGGAGAGAAACATACCAATGCAA
 GGTGTGCCCTGCCAAGTTTACCCAGTTTGTGCACTGAAACTGCACAAGCGCTCTGCACACCCGGGAGCGG
 CCCCAAGTGCTCTCAGTGCACAAAGAACTACATCCATCTCTGTAGCCCTCAAGGTTTACCTGAAAGGGA
 ACTGCGCTGCGGCCCGGCGCTGGGCTGCCCTTGGAAAGATCTGACCCGAATCAATGAAGAAATCGAGAA
 GTTTGACATCAGTGACAATGCTGACCGGCTCGAGGACCTGAGGATGACATCAGTGTGATCTCTGTATGTG
 GAGAAGGAAATCTGGCCGTTGGTGAAGAAAGAGAAAGAACTGGCCCTGAAGTGTCTTTGCAAGAA
 ACATGGGCAATGGACTCTCTCTCCTCAGGGTGCGACCTTTATGAGTCACTCAGATCTACCCCTCAAGAATT
 GCCTCCAGCAACCCATCTACTCTGTGACTGTAAAGGTCAAAACAGAAACAGTTGAACCAATGGATCTCT
 TAAGATTTCAGAAACACTTATTT

FIGURE 25

09719554-017001

FIGURE 26.1

62/64

GCTACTGCCACCGCCACGCGCCACCACCACTACTACCTACCATTTCCACCATCACCTCTACCATCA
CTACTGGCCCTCATGATAGCAGTCACCTGGAGATGACGTCCTGGGCGGCTCTGCCCTTCTATTCAGCAG
CAGCCTAATGTCCGGAGACCCAAAGCTCACTTTTGATGACTCGGTTTCAAACTGCTGATTATTCATGCA
GAGCTTAGAAGATCGTAGCACAAGGCTGATGCACTGTTTCGAGAAATTTGGCAAGCTGTGAATTTGCTG
ATGCGCGCTTCTCTCTCACTGAAATGTGGCAATGCCATGGAAACGCGACCTCTGGGAAGCAAGTCCCCATA
CACCATGTACTCTGAGACTGTGGAGCTCCTCAGGTATGCAATGAGGCTGAAAGAACTTTGCAAGTCCCTTG
GCTTCGGATGGGGACAAAAGCTAGCAGTACTATGCTACCGATGTTTATCACTCCTCTATTTCGAAATGT
TTAGCTGTAAGAGAGGACCATGCTATGAAGTACTCCAGATCACTGATGGAATATTTTAAGATGAGCTGCTC
AAAAGTCGCCACAGATACCTCTCCATGGGTAAAGCATGGAAGAAACATCCATCCCCAGCTGCTCTTCAAC
ACGCTGTCCCCCATCAACGCAATGGGGAAGCTGTAACAATGGCCAGTCAACCTTCCCGACGCGTTCAC
ACATGGCTGCCAGCCAGCTCAACATCACTAGCAATGTGTTTACGGGCTATGAACACTGGGATATGGCCGA
CAAACTGACAAAGAAAACAAGAATTCTTTGGTGATCTGGACACGCTGATGGGGCTCTGACCCAGCAGC
AGCAGCATAGCAAACTTTTCCGCTACGTTTCGCCAAGGACTGTGTGGCTGCGCATGATGCGCACTTTGT
TGTAGTGGGTGTTCTCAGATCTCTAGCATCAGCAACCATCACTCTACCTCTACAGGCGCACTGATGGTCA
CTGGTGGAACCTCACTCACTGGGGAACGTTCTCTTTGGTATGTTTTGTTTTTATGCTCTTTTGTATTCT
GTAAAAACAAGAAGTCATTGTAAAGTGAACATACAACTTAAGGGCAGTGAACGTTTTATTACTTAGTCAT
TTTTTTCTTTTAGCAATTTGATATGCATTCTCAGATTCCACCATCTTTTTGTGCTTTATGGAATGACAG
TCCCTACAAATATTGTTTTAAGCCCACTACCCAAAAACAAGAATGGGAAGCACTTTGTATAAGACAGG
CTCTCTGAGAATGTCAACAAGTGGTCTTACATATACATGAGAAGCTTAGACACAAGGAGCAATCCCCAAAC
TCTACTCTTATACTCCAGAAAACAATATTTAGAATCTGTCAAACTTTTGTGTATCCCAAGATTTCAAT
CTTCAGTGAGAAATTTTCATTGTCAAAACCCACTGGTTAGATGTTGTAGCAACATCATAAATCAAGAAT
ATCAAGAAATAAATAGCATAGCAATGCTACTCTTAAAGAAATGCTATGCCACACAACAGAGAGCTTT
CTTGTTAGCATCCCTTTCCTGATTCCCTATTTTTGTAAATTTTAATGATAAGAAGAAAGGTTGACATTTAT
TTTGACAAGTTTTAGGCATCAGCTGGCATCAGTGTTTTTCACTCCATTATTGTAAGTGTAAATCCCTCAC
CTGGGGTCTCTGTGTGCAAAAGCTGCTCTTTGAAGAACAAGTTGGTTGATGCATGCTGCTTAGTGCCAAA
ATGCTACACTCTAGACTTACAAGTGGGAGTTAAGAGAGGTTCTGGAAGAGTGTCCAACAGGAATTCACACC
CTCGCTCTCTTGTCAACAACAACATTTACACAGTTGGTAAGTGGTCCATAACTGGCAGGAATTTTAAAT
TGTAATTTGCTCAAACTATGGGAACAAAAGTCAAGGTATCACTACCTAGAAGTAAATGATATACAGTTTT
CTTCTAGTGGCTTGAAAATCTGGCACTTCTCAATTATTATTCACATTTTCTCTCTTATAGGTTTTCTGT
TTTCTACTTTCTTTTTCTCTTATCTGTGTTTCCCTTTCTTTTGGCTCATTAACCTTTTACATGAAT
TACAATTAATCTCTTTTATTAAGTCCATATTATTGTGAATCATTTCCATGAAAATTTCTTAAGAAAACCTC
AAACTCTCTAAATAGTAGCTAACTTTTATTTTTTAAATGAGTCTGGGGTAGTGTCTTCACTTGAGAT
GCTTTGAAGAGCCCTAAACATTTGGGAACCTTACCTAATTTGGAGACATTTCTCCTCGTGTGTGACTA
CCCCCTTAGATCCTCAACATTCATTTATGTCCCTAAACATGCCAATGTAAATATCATTTTGTATGTTT
CAGCTCACCAAGAAATCTTACACTTTGGGTAAACACTATCCATGCATTACTTACTGGTAATCACTTGCT
GGTATATAATTCATGTAGCCCTTAATATGCTGGGTATCAAATTTCTGTCACTGAGTTATGACCAGATA
ATAATAGATATGACATGAAGATGCAAACTTTGTGATATTAAAGCCAGCCATGAGGCTCATGATATA
GAACAGCAGGTGATGACTCTGCATCTCATTTGTCAGGTTAGCTATATCCCCAGTTGTGCAAAACAGCCAG
ACTTGAGTGTGCTCTGTGCATCTTTGAGTTTAAAGGCTTTTGTGTATAAGGCTGACTGTGAAGTTGATC
CAATGGCTGAAGCATGTTGTTAATATGGCTGATGGGAGCATCCCTGCACTGAACCCAGCAGCTTTTTAT
GCTCCAGCTGGTGGTGGCTTTATGTTTACAGTCTCAGCAACAACACTTATGCTCATCAAACTCTCAAA
TGAACCTGAAAGAACTTTCTGAGCCTCTTAAAGAGGAAAATGATGATACATTAAGAACTCTGAAC
ACCCAGAGTTGGTGTACATATAAAATTAAGCTGATGACTTTGCAGTGACTCAAGTTGTCTTTATCA
TGGTTTACAGCTAGAGTGCTGGCTATTACTATATAATGAAGGCCACTGGCTTGACTGTGAAGTTCAAC
CTAAACACAATCTAGACCATCATGGATTAGGAGTAGATTCTTCTTGAATCCACATCCAGAACTA
GACATAGAATGTGAGGAGTTCCTCCAGAGAAACAAGCATATTGCCATGGATGGAAGACTGTAGTT
CTAGTTTCAGTGACTTGTATATCTACTTACATACAACAGGAGCAAGAGGATTTCTGTCATCTG
TGACTGAGTGTAAATATGTGCCAAGCTCTGCAGCAGCTGACCAAACTCTGAACAATCGAGCTCTGGATC
CAGTGTATTATGATAGACTCATTTATAAAGCAGCTTAGGAACATTAATAACATGGAGGATGAATTACC
TTCTTATCCCTTGAGATAGACATCTTTCAGTTTCATGATTAAAGGATTTGTTGCTGTTTTATGATTACT
GTTCATCAGAGTAAATGGTGATGCGTGTGCTAGTGTGCACTATTTTAGGGGCAATAGGGATGGAGAT
ATTCTGTCAAATGAATCTCTTCAGTATACCGATTTGTGGGAGGATATGAGACATGTTGATGGCAGTAG

FIGURE 26.2

09719554.011801

63/64

AGATCGTGCCCTCTAGATCTTGATGGAGGCTTGGTGAGACACACTTAAATAAGCACGCTGGAGGTTAGAATA
 GAGGGCAGAGTAAAAAGGAAGCTCCATCTGAGCAGTACACCAAATGATCTCAGCCCTGCAACTTTGACCCA
 GGTAGGGCCACCACTACGCCCTTCACTTGTCA CCCAAGCTCCAAGCACAGAGAGTTTGACAAGTTTGTGTT
 ATGATGTTGGCTTGGCTTGTATTTTAACTTAACTTTGGATTTTGTAGTGGTTTGTGCATATACTGTCTG
 AGTTTGGTAGGATGAGTACTTTGAAAAGGGTTTACTAGTGTGGCTCTCGGGTGAAGATTAGCTGTAAAC
 ATGTTGTTAGCCAGCCTGTAGACTGTTAATTACTTAATACTCTCATTGGGAAAAATACTAGTAGTTTTATA
 TTTGGATGACATAATTGGA AAAAGCAGATTAGCTGCTACTACTTTTAAAAGACTTAAAGTGGGATGCTCT
 TTTTTCATGTAAAGAAATGAAAAGACCCAAATCTTCAGGCAAAAAGCAAGTTGCAAAATTAGAAACC
 ATTGGCTAAAAATTTGTTTGTGAGTTTCCAAATGGATGAATTTTCATTTTGACATATACATCACTAAAT
 TCATTAGATTGTTGCTGCAATGGAAAGATCTCTCTAGCATATCTTTCCCAAGATATCTTAATTGTGGAT
 TCTGTTTCATGCAAAATTTGCATCCCGAGGTTGAAGTTGGAGTTTGGAGTTGAAAAATATCTTTTGAAGGC
 AGAATCAGTTGAGTTGTGAGGTTGAAGCCTCACA TACTTCTCAACAGACATGATAAAATTCACCTGCATG
 AGTTGGCAGGTTGGAGAACCAAACTGGATCACTGGGTAAAGACTACTCAGTAAAGCAATGAAGCTTGTCT
 TAGAGAAGCATCACTATCCCATTTGAGAAAAATGTTGGCAGAGATGATACAGCTACACAGTACCAAAATGA
 ATGGGTCAATTTCAGCACCCCAAAATTAATTCTGTGGGGAAAAAATTATTGAGCCAGTTGTCTAGTTTCTG
 TTAACATGACTGGCAGACTAAATCTTCTCATGTTGTTGTTATTGTTGTTGTTGTTCTCATTTTCTCATGCG
 ACGGGCTTAATCTCATAATAAATCTAATTCTTTTCTCTTAGTGTAGTAGACTCCAACAGACAGAAG
 TGGCATCTGTGATTCTAATACAGCATTTACCTCTGGCAGGAGACTAATCAGATAGGCCGGTCTCAGACAT
 TAATCCTACCATCTGATATTTTGGTGAAGGAAAAAGTATTAATCTCTTTCATCTCTCTCTCCAGTAA
 TATAGAAGCCCTCTTTACCAAAATCATCACATTTTACTCTGTAACTACAGCTAAAAGAAAAATGCAATT
 GAAGCCCCACAAGCAGCAATTCAGTTCTTGCCCTTTTGGCCTGTGACATGAGATGTAAAAGAAATTTAT
 CATTGGCTCAGATGGGTTAGGGACACTGAATCTGCTTTTATGATCCATGATCAGTCAATCTTCTTCA
 AGAGATTGGAGCTTTGCTTTTCAATACTGTCAGTGTAGACTAATGGTGTATATAAAAAATCATTCAA
 AATTTCAAATCTTTTGGCAGTGACCTCAATTTTGTGGCTCTGTGATTGTTATCAGACTTTGAGGAGGG
 AAGGGGAAGTGAAGGAAGCCTACGCTCAGGCGCCCTGACAGATGCTGAGTAGCAAGCTCAAGCTCGCC
 TGCTCTGCCAGCATGTGCTGGTGAGCAGCAGCATGCAGACAGCTGTGGGAAGCCTCTGAAGAAATGCCCC
 AGCTGATGCTTTTCAGCTGGGAATAGTTTGTCTTATGGGAACTCATTGTTCTCCAGTCTCTGACAGCAG
 GAAGCCAGCTGTCAATTCGGAGGGAATTCAGATGCTTTACCTTTTGGTGTGCTGTCATCACTCAT
 GTGGCTACGAAAGTGTCTGAGAAATAGAGCCAAATGTTGGTGACAAATGGGTAGTCAAAATGCACCCAGAT
 GCTCAAGCCCTGTGTGGTCTGTCAGTGTATGAAATGGGAGGAAGGAGACCTCGGACAGTAAAGCAAA
 ATTGGAGACACTCCAAAGAGGCTAAGTTAATGCCGTGTTGCCCAAGAACAGATCTAGCTCTCATTTTGT
 CAGCCGTAGCATGCAACAGTGGTGTGCTGGTAAAAATGTTAA CAACAGCTCGAGTGAAGAAATAGAAC
 CTGGTTTGCACCAATTGCAATTTCCATGGCATAAATACTACCACCTTTAGATGATTTTAAAGCTAACCAAT
 GTGATGCTACTGAACACATGTTGGAAGAGATGCACGAGTTGGCTCTTGAAGCTGGGCAAAAATGTC
 TTCAACAGCCACTGGATGCAGCCAGTCAGAGGTTTCAATTTAATAATATGTGTTTATGTGGACACACAC
 AGACACACACACAACTCAGCCCTACACACACACTTCGATGACTAAAACATATACATAGTTTAAAGAT
 ATGAATCAATGTGTGAATGTAGAAAGCTTATGATAAGGCCCTAGAGGATGGGTTGCGCTTGAAGCCCTAG
 GTTTTACAGGAGAGATAGCTGGAAGAAATGAAGCCCTCTGAGCTGAAAGGAGAGATGATCAATGGAG
 ATGGTTCCATCATCTCTTCCATATCTCAGAGTAAAAATGGGCATCAGAAAACCTCAGGATTGATTTT
 TAAAAAGATAAGTGAGTGTGTTTTATTTTATTTATTTGTCATCATTTTGTATTTACAAATGCTATT
 TGTAACTTTTACATGTAATAGGATAAAGTATTTACGGGAATCTATGGAGAAATAGCACAATCCGAATTT
 TACTGTGTTTTTCTTTATGTGACGTGGAAACTCAGTAATTTCCCACTTCAATTTGTTTCAATAGA
 ATTTTTATTTAGTTATTTAGGAAATCTAAGTTTTTGTAACTTTGTTTATGTTTAAAGTATCTACTATTA
 CTGTTTATGTTCTGAAACTCAAAACGAAATATCTCTGTATCAATTGTCATGACTTTCAGAAACAAATATCC
 AAACCAAAATAATTTCTTTTCCACCGACTAGCAAGAAAACTAAGCTCAGTAACAGAAAGGCATAAACTAA
 AGTATAATGAGGCTTTCTATTAATAACACACACACACACACTACACACACATACACTTTTAAAA
 TTTTAAATTAGGCCCTCCACACATAAATCATTTTGAAGTAGAATAGAAAAATCTCAAAGAAATTCATCTCT
 CTGGTCTGTGCATCTCTCTCAGTTAATAAGAGGTTTGTATCTGGAAAGATGGAAGAAATCTGTTCTAA
 TCTATTTTTCAAAAAAAATTTCCATTTTCTCTCTGGGCCGTGATCCATGTTTGAAGTTTAGGCCCTGGA
 GGAGATCCATGCTTACTCGCTCTTCTGGGCCCTCTGCTGTTTGGCTCTGCAATTTCTTTTGTAGCTGG
 CAGATAGCAGGAGCTGGGGCTCTATCTTTCATGTATTGCTTCAATATTTGTTCTCTTGAAGAAATGG
 TAACATCGGGTCTGATTTAATTGGCATTACACTTACACAGGAGCTGTAGCACCCCGCTCACCACACA

FIGURE 26.3

64/64

GACGATGGGACAGTTTTCACAGCTACAAAGAGCTAGAAGTTGTGTTTAAACATCATCCAGTGCATCCCCCTAA
 TCTCAAAACATCTCCACTAATCAATCATATTCCACCATAAAATTACAAATGAGAGTTAGTTCCATCTCAA
 GACAAATTTGTCAAATACTTAATTTTCTTCTGGATGATTTCTACTTAGTGATTTTGAAGAAAGAAATGT
 TCTGAGATAAAATCTGCTCAATTTACTCAATATACAAATTTACTGTTTCTACTTCTATCTAGATAGTGCT
 TCTTGAAATTTTCTGCTGATGTGTGTTCTGTAAGAATGAATGTCAGTAGTGAGCCTTTTGAAGATAC
 CATGCTCAGACATCTCTTTGGGATCAGAAGATACCTAAATTTCTCCCTTTTGGCCACTTGTGTTAGATG
 AGTGATATATTTCTTGGATCTGCAAAAGAGAGATTTGTTCTTTCTTTCTGTTGCTGGTGATGGTGTG
 TATCTGTGGCTGTGATGGTTGTGTTAACTTGCTCTCTGCTGCTGCTCTGGCTTTTGTCTTCTCTGCTG
 AGTGTGTTCTTCTTTGCCAAAAATAGTTAAATTTAAACCTGAGCTGCTGAAATTTGACTTGTCTACTATT
 TCAAAACATACAGATTAATAAAAAATAGATGTGCTCGATTAAAAACATGCGCCCTGGAAAGGCATGTG
 TATTTAGAAATCTGATATAATTAACCTGATTAATACATGCGCATATAAATATTAGTCTGTTGAAATCTGT
 TGTCCAACTGTATAACTTTTGGGAGCAGTGTGTTGACCTTTGATACATAATCTGGAGAGAGTGGAGTGG
 TCTGAGGCAGATGAGACAGTGTATATCAGGAATTTTCAATCAACTTTAGTGGAGGCGCTGGCAATACAA
 AACATCTTCAGATGTTTCTGTAACTATATAAATGAAAACAACTCTTCAAAAATTTCCCATAGTAC
 TCTCAGTCAAGACTTTTAGGTTTACTTTTTTTCTATTCTCTCTTTCTCTTTCATTATTTTTCGAT
 GGGGGGTTGTTATCATGACTGAAGAATATTTTGATTGCAATGGTCTCTCTCTCTCCCCCTCTCTC
 TCTCTCTCTCTATTCTTCTCTCTCTCTCTCTGTCATACCCCTCAATTTAAATTTGAAATCTGGAGTGT
 TTGTGATAATCTGCATTAGACGAGCGCTATAGCTAGAATGAATCTGGGCAAAATCATGATGGGTTTCCA
 AAGAAATGCTCATGATTTCTTGGGCCCTTTCCACCCACAGTGTATAAATGAAGAAGTATAGAGTAGTTT
 TCTCAAAGAGCATTTAATATATATCTCTGAGACCTAATGCAAGTTTAAACATGTACTCCACCTATTTTTC
 CAGTAGGTAAATGTACTGACGACTGTGCAAAATACCCCTGAGAGTTTGCAGGGGTCTTCTGCTGTGCTCT
 GACGCTGTGTGTTGCTCTGTGATCTAACAGGCACATTCACTGCTCGTGATCATAGATATTTCCTTA
 ACATTCCTCACTGGCTGTATATAAGAATCAGAAAGATAATCCCAACATTTGTAATGGAAGTGTGACTC
 TATAACCTTTCTCTTCTCTGCGAAAAAAGAGCAATTTTCATGCATATTTTAAACAGAAATTTGATCA
 TTGATAGTGTCTAGAAAATTTTATTGAGTAACTGGGACACAAATGGGCAATTTTATGTCATCATATGCT
 TTGAGTGTGGGAGTCTTACCAACAGATGCTGCTGGACCATTTGGAATTTGGAATTTCAATCAAAAGAGT
 ACACATCGTAGCTGTGTGTGTGTGTGTGTGTGCTGCGCAGCAGCTGTGCTGTGTGTGCTCCCTGCATGTG
 CAACATCTCTAGCTGTGCTGCTCTTCAATGAGTTTTAGCTTTCTCTTTCTGAAAATCAATTTTACAGTT
 CAGGAGGCGCTGTTGATCACTACTATAGAAGCGAGTGAATGAAATGAAATTTCTTCTCTCTGGAAG
 TTTTGGTCTAAATATCATGTTTCAATTAACCGAATTTCCACCGCACTTTGTGATGAAAAAGGCTGTAA
 AATCCAATTGAGTTTCCAAAGAGAAATTTGATAGTGTCAAGATGATCAGAGGGAAGATGGAGGCCACT
 CAGCTGGAGAATCAGAGCTGAGTTGAGCCCTCAGTGTGAAGTGAATGCTGCTCCAGCTCGAGCTTAAAA
 CCTGGGGCCCGTCTGGCCATGCTGCTCCCTCAAGTAAATGATAGAGAGCAGAACATCAGGAGCAAGCCT
 GCTTGGCTCTTATGAAGAAATCTCTGAGCTCTGCTGCCCCAAGGAGAGACCTTTCCCCAAGGCGACCC
 CAGGTGGCCATTAATTTGTATGATCATTCAGAAGTGGCCCCCTGGCTTTTATGAAATCAAACTAGTCT
 CTGAAACCACTTTCTTGGGTGCGAATTTCCAACTCTATGCTCAATTCGACATCCCAACATGTCTGACTC
 TTCTTCAACAGCATGCTGCTCTGTCAGAATTTAGTAAGTTTCCAATTTCTGTCACAGCTGGGTGAAGC
 TGTCTAAAAATCAATCAATTAAATGAATGTTATCTGGTTTTTAAAGCTGGTTTCACTGCTGTTTATGTGT
 ATAAACTATATCTGCTGCTGTGGCTTTGCATTTCAAATGTGTGGCCGACAGCGCTTTTGTGGTCTTT
 GTTCTCAGTACAGTAACCTGTGTGACAAACTTTTAATGTGTTTTGTGTTTTCCAACAGATGTCTCT
 TGAANAATGATATTTGGCTGAGCTGGTGGCTGGTTTCTCTCATAGAGGCATTAACATATCTGCCAATGCA
 TTGAATTTTAAAAATGCAAAATAAAATTTTATGAAATCTCA

FIGURE 26.4

GETTING IT RIGHT

Declaration and Power of Attorney for Patent Application
Déclaration et Pouvoirs pour Demande de Brevet
French Language Declaration

En tant l'inventeur nommé ci-après, je déclare par le présent acte que :

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

As a below named inventor, I hereby declare that :

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed an for which a patent is sought on the invention entitled

Nucleic sequence and deduced protein sequence family with human endogenous retroviral motifs, and their uses

et dont la description est fournie ci-joint à moins

☐ ci-joint

☐ a été déposée le

sous le numéro de demande des
Etats-Unis ou le numéro de demande
international PCT

et modifiée le

(le cas échéant).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait références ci-dessus.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

the specification of which :

☐ is attached hereto.

☒ was filed on

as United States Application Number or
PCT International Application Number.
PCT/FR99/01513 filed on June 23, 1999

and was amended on

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des États-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les États-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

Prior Foreign application(s)

Demande(s) de brevet antérieure(s) dans un autre pays.

(Number) (Country)
(Numéro) (Pays)

98 07920 FRANCE

(Number) (Country)
(Numéro) (Pays)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(c) du Code des États-Unis, de toute demande de brevet provisoire effectuée aux États-Unis et figurant ci-dessous.

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des États-Unis, de toute demande de brevet effectuée aux États-Unis, ou en vertu du Titre 35, § 365(d) du même Code, de toute demande internationale PCT désignant les États-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du code des États-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande :

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

Je déclare que par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la section 1001 du Titre 18 du Code des États-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority claimed
Droit de priorité
revendiqué

(Day/Month/Year Filed) Yes ☒ No ☐
(Jour/Mois/Année de dépôt) Oui Non

23.06.1998
(Day/Month/Year Filed) ☐ Yes ☐ No ☐
(Jour/Mois/Année de dépôt) Oui Non

I hereby claim the benefit under Title 35, United States Code, § 119(c) of any United States provisional application(s) listed below.

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Status) (patented, pending, abandoned)
(Statut) (breveté, en cours d'examen, abandonné)

(Status) (patented, pending, abandoned)
(Statut) (breveté, en cours d'examen, abandonné)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: (mentionner le nom et le numéro d'enregistrement).

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to persecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

Norman F. Oblon, Reg. No. 24,618; Marvin J. Spivak, Reg. No. 24,913; C. Irvin McClelland, Reg. No. 21,124; Gregory J. Maier, Reg. No. 25,592; Arthur I. Neustadt, Reg. No. 24,854; Richard D. Kelly, Reg. No. 27,757; James D. Hamilton, Reg. No. 28,421; Eckhard H. Kuesters, Reg. No. 28,870; Robert T. Pous, Reg. No. 29,059; Charles L. Gholz, Reg. No. 26,395; William E. Beaumont, Reg. No. 30,996; Jean-Paul Lavalleye, Reg. No. 31,451; Stephen G. Baxter, Reg. No. 34,884; Richard L. Treanor, Reg. No. 36,379; Stephen P. Wehrhouch, Reg. No. 32,829; John T. Goolkasian, Reg. No. 26,142; Richard L. Cinn, Reg. No. 34,305; Stephen E. Lipman, Reg. No. 30,011; Carl E. Shlier, Reg. No. 34,426; James J. Kubaski, Reg. No. 34,648; Richard A. Neifeld, Reg. No. 35,299; J. Dereck Mason, Reg. No. 35,270; Surinder Sachar, Reg. No. 34,423; Christina M. Gadiano, Reg. No. 37,628; Jeffrey B. McIntyre, Reg. No. 36,867; William T. Enos, Reg. No. 33,128; Michael E. McCabe, Jr., Reg. No. 37,182; Bradley D. Lytle, Reg. No. 40,073; and Michael R. Asey, Reg. No. 40,294, with full powers of substitution and revocation.

Addresser toute correspondance à :

Send Correspondence to :

OBLON, SPIVAK, McCLELLAND, MAIER & NEUSTADT, P.C.
FOURTH FLOOR
1755 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VIRGINIA 22202 U.S.A.

Addresser tout appel téléphonique à :
(nom et numéro de téléphone)

Direct Telephone calls to : (name and telephone number)

(703) 413-3000

Nom complet de l'unique ou premier inventeur		Full name of sole or first inventor	
Phtrick M. ALLIEL			
Signature de l'inventeur	Date	Inventor's signature	Date
<i>Phtrick M. Alliel</i>	26/12/2000		
Domicile		Residence	
F-92140 Clamart (FRANCE)	FRX		
Nationalité		Citizenship	
Française			
Adresse Postale		Post Office Address	
4, rue Lazare Carnot F-92140 Clamart (FRANCE)			
Nom complet du second co-inventeur, le cas échéant		Full name of second joint inventor, if any	
Jean-Pierre PERIN			
Signature de l'inventeur	Date	Second inventor's signature	Date
<i>Jean-Pierre Perin</i>	26 Dec 2000		
Domicile		Residence	
F-92350 Le Plessis-Robinson (FRANCE)	FRX		
Nationalité		Citizenship	
Française			
Adresse Postale		Post Office Address	
182, rue d'Aulnay F-92350 Le Plessis-Robinson (FRANCE)			

(Fournir les mêmes renseignements et la signature de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)

French Language Declaration

2011 Nom complete du troisième co-inventeur, le cas échéant François RIEGER		Full name of third joint inventor, if any	
Signature de l'inventeur	Date 28 Dec 2011	Third inventor's signature	Date
Domicile F-92100 Boulogne (FRANCE)		Residence	
Nationalité Française		Citizenship	
Adresse Postale 38 bis, boulevard de la République 92100 Boulogne (FRANCE)		Post Office Address	
Nom complete du quatrième co-inventeur, le cas échéant		Full name of fourth joint inventor, if any	
Signature de l'inventeur	Date	Fourth inventor's signature	Date
Domicile		Residence	
Nationalité		Citizenship	
Adresse Postale		Post Office Address	
Nom complete du cinquième co-inventeur, le cas échéant		Full name of fifth joint inventor, if any	
Signature de l'inventeur	Date	Fifth inventor's signature	Date
Domicile		Residence	
Nationalité		Citizenship	
Adresse Postale		Post Office Address	
Nom complete du sixième co-inventeur, le cas échéant		Full name of sixth joint inventor, if any	
Signature de l'inventeur	Date	Sixth inventor's signature	Date
Domicile		Residence	
Nationalité		Citizenship	
Adresse Postale		Post Office Address	

(Fournir les mêmes renseignements et la signature de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)

528 Rec'd PCT/PTO 26 DEC 2000

SEQUENCE LISTING

<110> INSERM
ALLIEL, Patrick
PERIN, Jean-Pierre
RIEGE, Francois

<120> NUCLEIC SEQUENCE AND DEDUCED PROTEIN SEQUENCE FAMILY
WITH HUMAN ENDOGENOUS RETROVIRAL MOTIFS,
AND THEIR USES.

<130> 598EXT21

<140>
<141>

<150> 9807920
<151> 1998-06-23

<160> 122

<170> PatentIn Ver. 2.1

<210> 1
<211> 2599
<212> ADN
<213> Homo sapiens

<400> 1
atccccctgcc ttaatcgcca agctccttca ggagaaacaa gaacaggcca ttacccttga 60
gaagactggc aactgatttt acccacaagc ccaaacctca gggatttcag tatctactag 120
tcctgggtaga tactttcacg ggttgggcag aggccttccc ctgtaggaca gaaaaggccc 180
aagaggtaat aaaggcacta gttcatgaaa taattccacg attcggagctt ccccgaggctt 240
tacagagtga caatagccctt gctttccagg ccaacagtaac ccaggaggtat tcccaggcgt 300
taggtatagc ataccactta cactggcgctt gaaggccaca gtcctcaggg aaggtcgaga 360
aaatgaatga aacactcaaa ggacatctaa aaaagcaaac ccaggaaacc cacctcacat 420
ggcctgtctt gttgcctata gccttaaaaa gaattctgca ctttccccaa aaagcaggagc 480
ttagcccata cgaatgtctg tatgcaaggc ccttcataac caatgacctt gtgcttgacc 540
caagacagcgc aacttagttg cagacatcac ctcttagcc aaatatcaac aagtctttta 600
aacattacaa ggaacctatc cctgagaaga gggaaaaagaa ctattccacc ctgtgacat 660
ggtatttagt aagtccttcc cctctaattc cccatcccta gatcacatctt gggaaggacc 720
ctaccaggtc attttatcta ccccaactgc ggttaaaagt gctggaagtgg agtcttggac 780
acatcacact tgagtcaaat cctggaactt gccaaaggaa cctgaaaaac caggagacaa 840
cgctagctat tcctgtgaac ctctagagga ttctgcctgt ctcttcaaac aacaaccagg 900
aggaaagtaa ctaaaatcat aaatcccatc ggccctccct tatcatattt ttctctttac 960
tgttctttta cctcttttca ctctcactgc accccctcca tgccgctgta tgaccagtag 1020
ctccctttac caagagtttc tatggagaat gcagcgtccc ggaatatattg atgccccatc 1080
gtataggagt ctttctaagg gaaccccac ctctcactgc cacacccata tgccccgcaa 1140
ctgctatcac ttgcccactt ttgcatgca tgcaaatact cattatttga caggaaaaat 1200
gattaatcct agttgtcctg gaggacttgg agtcaactgtc tgttggactt acttcacca 1260
aactggatag ttctgatggg gtggagtcca agatcaggca agagaaaaac atgttaaaaga 1320
agtaactctcc caactcacc gggtagactg cacctctagc ccttacaagg acttagatct 1380
ctcaaaaaata ctgaaaaccc tccgtaccca tactgcctgt gtaagccctat ttaataccac 1440
cctcaactgg ctccatgagg ttctggccca aaacccctact aactgttggg tactgccccc 1500
cctgaacttc aggcctatgt tttaaatccc tgtacctgaa caatggaaca acttcagcac 1560
agaaataaac accactccg ttttagtagg acctcttgtt tccaactctg aaataacca 1620
tacctcaaac ctccactctgt taaaatttag caatactaca tacacaacca acttcccaag 1680

09719554-013001

```

catcaggtgg gtaactcttc ccacacaaat agtcgctta ccttcaggaa tatttttttg 1740
ctgtgtggac tcagcctatc gttgtttgaa tggctctcca gaactatagt gcttcccttc 1800
attttagtg ccccttatga gttgtttgaa tggctctcca gaactatagt gcttcccttc 1860
taagcccccgc aacaaaagag taccctatct tcttttttgt ataggagcag gagtgtcagg 1920
tgactagagt actggcattg gcggtatcac aacctctact cagttctact acaactatct 1980
tcaagaacta aatggggaca tggaaacgggt cgcgcgactcc ctggtccact tgcaagatca 2040
acttaactcc cttagcagcg tagtctctca aaatcgaaga gcttttagact tgctaaccgc 2100
tgaagagggg ggaacctgtt tatttttagg ggaagaatgc tgcattatgt ttaatcaact 2160
cggaactcgt actgagaaag tttaaagaaat ctgagatcga atacaacgtg gagcagagga 2220
gcttcgaaac actggaccct ggggcctctc cagccaatgg atgccttggg ttctcccttc 2280
cttagacact cttagcagct taattattgt actcctcttt ggacctctga tctttaacct 2340
ccttgttaac ttgtctctct ccagaatcga agctgtaaaa ctacaaatgg agcccaaga 2400
gcagtcacaag actaagatct accgcagacc cctggaccgg cctgctagcc cagcatctga 2460
tgttaatgac atcagaaggca cccctcctga ggaatctcca gctgcacaa cctctactacg 2520
cccaattcca gcaggaagca gttagagcgg tctcgcccaa cctcccaac agcacttagg 2580
ttttctctgt gagatgggg 2599

```

<210> 2
 <211> 1326
 <212> ADN
 <213> Homo sapiens

```

<400> 2
gccgctctggc actcctgagg gaagtataaa ttataacacc atctttacagc tagacctctt 60
ttgtagaaaaa ggcgaatgga gtgaagtgc ataaagtaaa actttctttt cattaagaga 120
caactcacaaa ttatgtataaa agtgtgattt atgcccataca ggaagccttc agagtctacc 180
tccctatccc agatccccgc actccttccc caactataaa ggaacccccc taactcccaa 240
tggctcaaaa ggagatagac aaaaagggtc acagtgaacc aaagagtgcc aatattacct 300
aattatgacc cctccaagca gtgggagaaa gagaattcgg ccagccacga gtgcattggc 360
cttttctctc ccagactta aagcaataaa aaacagactt aggtaaattc tcagataacc 420
ctgatggcta tattgatgtt ttacaagggt taggacaatt ctttgatctg acatggagag 480
atataatgtc actgttaaat cagacactaa ccccaaatga gagaagtgc accataactg 540
cagcctgaga gtttggcgat ctctggatc tcagttaggt caatgatagg atgacacag 600
aggaagagaga atgatcccc acaggccagc aggcagttcc cagtctagac cctcattggg 660
acacagaatc aqaacatgga gattggtgct gcagacattt gctaacttgt gtgctagaag 720
gactaaggaa aactaggaag aagtctatga attactcaat gatgtccacc ataacacagg 780
gaagggaaga aatcctactt gcctttctgg agagactaag ggaggcattg aggaagcgtg 840
cctctctgtc actcgactct tctgaaggcc aactaatctt aaagcgttag tttatcactc 900
agtcagctgc agacattaga aaaaaacttc aaaaagtctgc cgtagggccc cgcaaaact 960
tagaaacctt attgaacttg gcaacctcgg tttttataa tagagatcag gaggagcagg 1020
cggaacagga caaacgggat taataaaaaa gccaccgctt tagtcatcag cctcaggcaa 1080
gtggaacttt gaggcctctg aaaaaggaaa agctgggcaa attgaatgcc taatagggct 1140
tgcttccagt gcggtctaca aggcacttt aaaaaagatt gtccaatgag aagtaagcgc 1200
ccccctcgtc catgcccctt atttcaaggg aatcactgga aggccactg ccccgaggga 1260
caaagtcct ctgagtcaga agccactaac cagatgatcc agcagcagga ctgagggtgc 1320
ctgggg 1326

```

<210> 3
 <211> 10499
 <212> ADN
 <213> Homo sapiens

```

<400> 3
ccctggggcg ggcttcttt ctgggatgag ggcaaaacgc ctggagatgc agcaattatc 60
ttgcaactga gagacaggac tagctggatt tcttagggcg actaagaatc cctaagccta 120
gctgggaagg tgaccacgtc cacttttaaa cacggggcct gcaacttagc tcacacctga 180

```

ccaatcagag agctcactaa aatgctaatt aggcgaagac agggaggttaa gaaatagcca 240
 atcatctatt gcctcgagagc acagcaggagc ggacacaacat cgggatataa acccaggcat 300
 tcgagctggc aacagagacc cccctttggg tcctctccct ttgtatggga cgtgttttca 360
 tgctatttca ctctattaaa tcttgcaact gcactctctt ggtccatgtt tcttaaggct 420
 cgagctgagc ttttgcctac cgtccaccac tgcgttttgc caccaccgca gactcgccg 480
 gactcccat ccccttggat cctgcagggt gtccgctgtg cctcgtatcc agcagggcgc 540
 ccattgcccgc tccaatttgg gctaaaaggct tgccatttgt cctgcacggc taagtgcctg 600
 gggtttgtct aattgagctg aacactatgt actgggttcc atggtttctct tctgtgacc 660
 cggctctcta atagacatat aacacttacc acatggccca agatccatt ccttggaa 720
 cgtgaggcca agaactccag gtcagagaat acgaggcttg ccaccatctt ggaagcggcc 780
 tgctaccatc ttgggaagtgg ttaccaccaca tcttgggagc tctgtgagca aggagcccc 840
 tggtaacatt ttgcaaccac gaacggacat ccaaatgtgt gagtaattt ggaccacttt 900
 cacttgcata tctgtcttat ccttcccttag aattggagga aaataccggg cacttgcctg 960
 ccagttaaaa acgatttagt tggccaccgg acttaagact cagggtgtgag gctatctggg 1020
 gaagggtctt ctaacaacccc ccaacccttc tgggttgggg acttggtttg cctcaagcca 1080
 gcttccactt tcagtttttt tggggaaagcc gagggccgac tagaggcaga aagctgtcgt 1140
 cctgaactcc cggcagtagc cgtttgagat catggttagc ccagaagtct caacagtcgc 1200
 ccattgcatg acccttatct ttcttcttga cccataactc ctgggttccc acccaactt 1260
 tcttcaatgt ttgaccccaa aattctcctt acccttgaat atacttccct tgcctcctgc 1320
 tctctaggta ctattgtgtt agacttccat ttctctagc aaagtgtatc tccaaaggcca 1380
 tctaaaggag cctctgcgtg cgtctttagc caactaggct ataaccggat gacttcttct 1440
 cctggtgtcc cctccaaatt aggcatacag ctcttgacat gggcagttat gaaggaccca 1500
 cctccccacc ccttctggcg ggcccaaatg ttgtaattgg ctgagggaaa agagagacga 1560
 aggagagaga gagaataagg gagaagaagc agagagacag agagagagga gagacagga 1620
 gagagacaga agagagagag agacaaaagg agagagagga gactcaaggc gagaagaaa 1680
 gagaagaata tagtaaaaaa cagtgtgccc tattctctta aaagccaggg taatttttaa 1740
 actgtactt gataattgaa ggttctctct gtgacctata agcactccaa cctcctttgt 1800
 ggtcagtgta aataagagca tagggccgaaa gcactgaggc cattgacac ccttagcttc 1860
 cctatcaaaa atctttaacc cagtaaacccg cagatggacc aaatgcattc agtcggtagc 1920
 gcaactgctt tgctaaaaat agaaaaagtaa cttttagagg aaactctcat gtgagcacc 1980
 ctcacttgtt cagaatttat ctaataaaaa aagcaaaaag gtacttact aactcaaaaa 2040
 tcttaaaagta tggggctatt cgtttagaaa aaggtaatgt aactccaacc actgataatt 2100
 ccccttaacc acgagatttc ttaacgggat ttaattctta attaccatac aaaggtccga 2160
 ccagacactg cgggaactcc cttcaggaca ggacgataga ttgttctctc caaggtattg 2220
 aggaaaaaaa ccacaattggg tattcagtaa ttgatacggg gaactcttgc cagcagagat 2280
 tagaaaaaaa gcttaataac ttgtctctcc aaacggttgc gctgttttga ctgagccaa 2340
 cctttaaagta cttacagaat caaaagacta tctcaatctt gattcaaaag gttagctaca 2400
 cctctcttgt aatgcatttg cataagaact tgtttatggg aatgcatttt gatggggcag 2460
 ctggggttgt ataaaatagg aaaccagccc agctctagca ctccaccctg aggcgcaaag 2520
 caatgttggg catgtctgta aaggaccact agaactcagg agaccagacc ccttcttttg 2580
 tggctcaagaa agggcgggaaa aggggtgcag gactgttaca tcggtaagca taactaatc 2640
 gataaacaga gttccatggg ttgtttacga ccttggaagg gaactcacc ctgagacaa 2700
 aggcatttgt gggcaccgctg gtaaaaggacc actagaatcc agcagccctg accctttct 2760
 ttgtgttcaa gagagcgagg aaaaacagtg caggactgca acatcagtg gataactaa 2820
 tctgataagc agaggtccat ggggtgtgtg gcaccctgga aagaataagc attagacca 2880
 tagagacac tcaggagacta aagctcatcg gaaaaagtact aggggttgcg gactccctat 2940
 ttcttttttt cagatgggaa acgttccccg caagacaaaa acgcccctaa gacttattc 3000
 ggagaatttg gaccaatttg accctcagac actaagaaga aacagctata tattctctg 3060
 cagtgccggc tggcactctct gagggaaagta taaattataa caccattcta cctcagagtc 3120
 tcttttttag agaaagccaaa tggagtgaag tgccataagt acaaaacttc ttttcttaa 3180
 gagacacaa caaattatgt aaaaagtgtg atttatgccc tacagggaag cctcagagtc 3240
 tactcccta tcccgactcc cccgactcct tcccaacta ataaaggacc ccttcaagcc 3300
 caaatgttcc aaaaagagat agacaaaagg gtaaacagtg aaccaaagag tgcacattt 3360
 cccaattat gaccctcca agcagtgagg ggaagagaat tcggccagc cagtagtagc 3420
 gtgctctttt ctctccaga cttaaagcaa ataaaaaac acttagtta attctcaag 3480
 aaacctgatg cttatattga tgttttacia gggttaggac aattctttga tctgacatg 3540
 agagataaa tgtcactgct aaatcacaca ctaaccccaa atgagagaag tgccaccata 3600
 actgcagcct gagagtttgg cgtatctctg tatctcagtc aggtcaatga taggatgaca 3660

acagaggaaaa gagaatgatt cccacacaggc cagcaggcag tccccagctt agaccctcat 3720
 tgggacacag aatcagaaca tggagattgg tgcctgcagac atttgctaac ttttggctga 3730
 gaaggactaaa ggaataactag gaagaattct atgaattact caatgatgtc caccataaca 3840
 cagggaaggg aagaaaatcc tactgccttt ctggagagac taaggagaggc taaggagaggc 3900
 cgtgcctctc tgtcacctga ctctctgaa ggccaactaa tcttaaaagc atgtgagaggc 3960
 actcagtcag ctgcagacat tagaaaaaaa ctccaaaagt ctgcctgagg cccgcagcaa 4020
 aacttcgaaa cccatttgaa ctggcaacc tgggtttttt ataatagaga tcaggaggagc 4080
 caggcgagaa ttgaaaagc ggattaaaaa aaaggccacc gctttatgca tgacctcatg 4140
 gcaagtggac gttggaggt ctggaaaagg tacaaggaca ctttaaaaaa gattgtccaa gtagaagtga 4200
 ggcttgcttc cgtccatgcc cctatttca aggaatcac tggaaaggcc agtcccccag 4260
 gggacaaaagg tcccttgagt cagaagccac taaccagatg atccagcagc aggactgagg 4320
 gtgcctgggg caagcgcacat cccatgccat caccctcaca gagccctggg tatgcttgac 4380
 cattgagggc caggaggttg tctcctggac actggtgagg tcttctatg cttactcttc 4440
 tgtcccgagc aactgtcttc cagatctgtc tgactggggg ggggtcttaa gacgggcagt 4500
 cactagatca ttctcccagc cactaagtta tgactggggg gctttattct ttccacatg 4560
 ttttctaatt agcttgaaa gccccactac ctgttgagg agagacattc tagcaaaaagc 4620
 agggggcatt atacacctga acataggaga aggaacaccc gtttgtgttc ccttgcttga 4680
 ggaaggaaat aatcctgaag tctgggcaac agaaagacaa tatggacgag caaagaatgc 4740
 cegctctggt caagttaaac taaaggattc cactctcttc cctaccaaa ggcagctacc 4800
 cctcagacc aaggcccaac aaggactcca aagattgtt aaggaccata aagcccaagg 4860
 cctagtaaaa ccatcgatga accctcgag tactccaatt taggagtaac agaaacccaa 4920
 cagacagtag aggttagtgc aagatctcag gattataaat gaggtctgtg tctcctata 5040
 gccagctgta cctagccctt atactctgct tcccaaaaat ccagaggaag cagagtgggt 5100
 tacagctgtg gactctcagg atgctcttct ctgcatccct gtacatctgc actctcaatt 5160
 ctgtttgttc ttgagaataa ctcaaaaccc aacatctcaa ctacactgga ctattttac 5220
 ccaaggtgac agggatagtc cccatctatt tggccaggca ttagcccaag ctttgagcca 5280
 atctcacaac ctggcacaat gtccctcggt aggtggaatg tttactttgc gccgcccatt 5340
 cagaaaacctt gtgccataa gccaccacaa cgtctctcaa tttcctcgct actgtggctt 5400
 acatgtgttc caaaccaagg cctcaactct gctcacaga ggttacttag ggtcaaaatt 5460
 atccaaaagg accagggccc tcagtggaga acacatccag cctatactgg cttactctca 5520
 tcccaaaaac ctaaaagcaac taaggggatt ccttgggcta ataggtttct gccgaaaatg 5580
 gattccagg tatggcgaaa taaggcaggct attaaataca ctaattaagg aaactcagaa 5640
 agccaaatcc catttagtaa gatggacaac tgaagtagaa gtggctttcc agagccctaac 5700
 ccaagcccca gtgttaagt tgccaaacag gcaagactt tctcataag tcacagaaa 5760
 aacagaaata gctctaggag tccctacaac gatccgagg atcactgttc tacgggtagt 5820
 atacctgact aaggaaaatt atgtagtggc tatctgaagg agttaaaata atacagggaa gatattctac 5880
 ggtggcagta gcagctctag tatctgaagg actcactgct aaaggagact tgtggtgtct 5940
 tgtgtggaca tctcatgat ttacttaaat gtcaggctct attactgaa gggccagctg tcgcactgtc 6000
 agacactgca actcttaacc cagcacaact tcttcacag aatgaagaaa agataaaaac 6060
 caactgtgca caagttaatt ctcaaaccta tgcactcga ggggaccttt tgagactttc 6120
 tttagactg cccgaacctc acttgatata ctgtggaagt tcccttgtag aaaaaggact 6180
 tcgaaaaggg gggtagtcag ttgtcagtga tagcagaact aatggccctc acttggaagt 6240
 tcaggaaact agtgctcagc tagcagaact aatggccctc acttggaagt 6300
 agaaagaaa agggcaataa tatatacaga ctctaaatat gcttaactag atccctcatc 6360
 ccatgcagca attaggaaag aaagggaatt cctaaactct gagagaacac ctatcaaaa 6420
 tcagggaacc aaaaagagct tattattggc tgacagagaa cctaaagagg tgcagctgtc 6480
 acactgcggg ggtcactcaga aaaggaagga aagggaataa gaagagaact gccaaagcag 6540
 tattgagacc aaaaagagct caaggcagga ccctccatta gaaatgctta taaaacaccc 6600
 cctagatag ggtaatcccc tccgggaaac caagcccccag tactcagcag gagaacacag 6660
 atggggaaac tcacagagac agttttctcc cctcgggagc gctagccact gaagaaagg 6720
 aaaaactttt gcctcgaact atccaatgga aattacttaa aacccctcat caaaccttct 6780
 acttaggact cgtatgcacc catcagatg ccaaatcatt atttactgag caggctctt 6840
 ccaaaactat caagcagata gtcaggggct ctgaagtgtg ccagagaat aaacctctgc 6900
 ctatatcgca agctccttca ggagaacaaa gaacaggcca taccctgagc gaactctg 6960
 aactgtttt accccacaag ccaaacctca gggatttcag tatctactag tctgggtaga 7020
 tactttcacg ggttgggcag aggccttccc ctgtaggaca gaaaaggccc aagaggtaat 7080

aaagggcacta gttctatgaaa taattcccag attcgggactt ccccgagggt tacagagatga 7200
 caatagccctt gctttccagg ccaagtaaac ccaggggagt tccccagggt taggtatacg 7260
 atatcactta cactgcgcct gaagggccaca gtccctcaggg aaggttcgaga aaatgataga 7320
 aacactcaaa ggacattctaa aaaagcaaaa ccaggaaaacc cacttcacat ggctcgtctt 7380
 gttgcccata gccctaaaaa gaatctgcac ctttccccc aaagcaggac tttagcccata 7440
 cgaaatgctg tatggaaggc ccttcataaac caatgaacct gtgcttgacc ttgtagccatc 7500
 aacttagttg cagacatcac ctccctagacc aaatatcaac aagttcttaa aacatatcaa 7560
 ggaacccatt cctgagaaga gggaaaaaga ctattccacc ctgttgaca ggatattagc 7620
 aagtcacctc cctctaattc cccatcccta gatacatctt ggggaaggacc ctacccagtc 7680
 atttatctca ccccaactgc ggttaaaagt gctggagtag agtcttgga acatcacact 7740
 tgaagtcaaat ccttgatact cccaaaggaa cctgaaaaac caggagacaa cgttagcat 7800
 tctctgtgaac ctctagagga ttgctgcctg ctcttcaaac acaaccagg aggaaagtaa 7860
 ctaaaaatcat aaatcccat ggccctccct tatcatattt ttctctttac tgttcttta 7920
 cccctcttca ctctcactgc accccctcca tgccgtgta tgaccagtag ctccctctac 7980
 caagagtttc tatggagaat gcagcgtccc ggaaatatg atgcccacc ctgttagagt 8040
 ctcttctaag gaaccccac ctccactgcc cacaccata tgcccgcga ctgtatcac 8100
 tctgccactc ttgcatatg tgcaaatact cattattgga caggaaaaat tactaatcct 8160
 agtgtgctct gaggactctg agtcaactgtc tgttggaact acttcaccca aactggtatg 8220
 tctgtagggg gtggagtcca agatcaggca agagaaaaac atgtaaaaga agtaactccc 8280
 caactcaccc ggttacatgc cactcttagc ccttcaaaag gactagatct ctcaaaata 8340
 catgaaaccc tccgtaccda tactcgcctg gtaagcctat ttaataccac cctcaactgg 8400
 ctccatgagc tctcggccca aaacctact aactgttga tatgcctccc ctggaacttc 8460
 aggcctatct ttccaatgaa tgtacctgaa caatggaaca actcagcac agtaataaac 8520
 accacttcg ttttagtagg acctcttgt tccaactctg aaataaccca tactctaaac 8580
 cctactctgt taaaatttag caataactaca tacacaacca actcccaatg catcagtggt 8640
 gtaactcttc ccacacaaat agtctgccta cctcaggaa tattttttg ctgtggracc 8700
 tgaacctatc gtgtttgaa tggctcttca gaactatgt acttctctc atctttagt 8760
 cccctatga ccatctcac tgaacaagat ttatcacagt atgtcatatc taagccccc 8820
 aacaaaagag taccattct tctttttgt ataggagcag gagtgttagg tgcactagg 8880
 actggcattg gcggtatcac aacctctact cagtcttact acaactatc tcaagaacta 8940
 aatggggaca tggaaatggg cgccgactcc ctggtcacct tgcgaagatc acttaactcc 9000
 ctagcagcac tagtcttcca aaatcgaaga gctttagact tgcataaccg tgaagaagag 9060
 ggaacctgtt tattttggg ggaagaatgc tgtttattatg ttaatacaac cggaactctc 9120
 actgagaaag ttaagaagaa tcgagatcga atacaactga gaggcagaga ccttcgaaac 9180
 cctggccctt gggtccctct cagccaatgg atgcccctga ttctccctct cttaggacct 9240
 ctagcagcta taatatgtct actctctttt ggacctctga tctttaacct cctgttaac 9300
 ttgtctcttc ccagaatcga agctgtaaaa ctacaataag agcccaagat cgactccaag 9360
 actaagctct accgcagacc cctggaccgg cctgctagcc cagcatctga tgttaatgac 9420
 atcaaaagca cccctcctga ggaatctca gctgcacac ctctactacg ccccaatgac 9480
 gcagggaagca gttagagcgg tctcggccaa agcacttagg ttctctgtt 9540
 gagatggggg actgagagac aggactagct ggatttctta ggctgactaa gaatccctaa 9600
 cctagctctg gaaggtgacc acatccact tttaaacagg ggcttgcaac tagtctcaa 9660
 cctgacaaat cagagagctc actaaaaatg taattagcca aagaaggag atgtagaagt 9720
 agccaactat ctattgcctg agagcacagc agggaggaca atgatcgga tataaaccca 9780
 agtcttcgag ccggcacaag caacccccct tgggtccctc cctttgtat gggaactct 9840
 ttttactgt attcaactct attaaactt gctcgcctc tcttctgttc actgtttct 9900
 accggttgag ctgagcttct cctgacttcc caccactgct gtttgccgc accgcagacc 9960
 cgccgtctgac tccactctc ctggatcatg cagggtgtcc gctgtgctc gctccagcg 10020
 aggcacccat tgcgcctccc aatcgggcta aaggcttgcc attgttctg catggctaa 10080
 tggctggggt cctctcaatt gagctgaaca ctagtcaact gtttccatg ttctctctg 10140
 tgacccacag cctctaagat agctataaca ctaccgcgat ggcccaagg tccattctt 10200
 gaatccataa gttcaaaagc cccaggtcag agaacacag gcttgccacc attctggacc 10260
 ctctgtgagc aaggaccccc aagtaaacaca accatgaggg tgcaaatgca tgggcaacta 10320
 atgttagagc aagaaaaagc aaggccctg gttcctcgaa gcatcaagt agctgaaatt 10380
 cctgcccctg atgtctatct cctaggtgtt ttctcctg aagcagata aacctttgt 10440
 tcaactctcc aagtagggct tctattacag cccaactcaa tcccacccc agatgacat 10499

<210> 4
 <211> 2784
 <212> ADN
 <213> Homo sapiens

<400> 4
 ctcccttcagg agaacaaga acaggccact acccaagaga agactggcaa ctagatttta 60
 cccatttcgac caaatctcag ggatttcagt atctactagt ttgggtagat acccttcactg 120
 ttggggcaga ggccttcccc tgtaggcagc aaaaagccca agaggtaata aacgttcactg 180
 aaataattcc cagatttcga cttccccaa gcttacagag tgacaattggc cctgctttcaa 240
 aggtcacagt aacccaagga gtatccagg tgttaggtat acaatatcac tcacactggc 300
 cctggaggcc acagtctcga ggaagggtgg agaaaaatgaa caaaacactc aaatgacatc 360
 taaaaaagct aatccaggaa acccaacctcg catggcctgc tctgttgcc atagccttac 420
 taagaatccg aaactctccc caaaaagcag gacttagtcc atacaaaatg ctgtatggac 480
 ggccctctctt aaccaatgaa cttgggcttg accgagagac agccaactta gttgcagaca 540
 tcatctctctt agccaaatat caecaggctt ttaaaacatt acaggggagcc tgtccccaa 600
 aagagggaaa ggaactattc caccctgggt acatggtat agtcaaagtc cttccctcta 660
 attccccact ctagatatac tctggggaag gaaactacc agccatttta tctaccctaa 720
 cggcaggttaa ggaactcaga gcggagctct ggatacatca cactcaagtc aaacctcga 780
 tactgcacaa ggaactcaaa aatccatgag acaatgctag ctattcctgt gaacctctag 840
 aggatctggc cctgtcttc aaatgacaa cagggggaaa gtaactaaaa tcgtaaattcc 900
 cctggccctc ccttatcata tttttctct tactgtctc ttacccccct tcaactctac 960
 tgacccctgc ccatgccact gcacccctgc catgccctg ccatgccagt agctccccct 1020
 agcaagagtt tctatggaga atgcagctc ccggaaatat tgatgcccca ttgtatagga 1080
 gttttatctaa gggaaacccc accttcaatg cccacaacca tatgcccca aactgctata 1140
 actctgccac tctttgcatg catgcacata cctattattg gacaggaaaa acgtttaatt 1200
 coagttctcc tggaggaact ggaggaacta cttcaactat accagtatgt ctgtgtgggg 1260
 tggagtccaa gatcaggcaa cagaaaaaca cataaaggaa gtaattctcc aactgacctg 1320
 ggtacatagc acccttgccc cctacaaagg actagatctc tcaaaactac atgaaacct 1380
 cctaccctat actggctcgg taagctattt taatbcaacc ctgactgggc tccatgaggt 1440
 ctgcctccaa aacccctacta actgttggat gtgcctcccc ctgcacttta ggcacatact 1500
 tccaactccc atacctgaac aatggaaaca cttcagcaca cttcagcaca gaaataaaca 1560
 ttttagtagt cctctttcca atctggaaat aacccatacc tcaaaacctca cctgtgtaaa 1620
 atttagcaat cactatagaca cagccaactc ccaatgcctc aggtgggtta cctctccacc 1680
 acgaatagtc tgcctacctc caggaaatatt ttttgtctgt ggtacctcat cctatcatgt 1740
 tttgaatggc tcttcagaa ctgtgtgctt cctctcattc ttagtggccc ctatgcccat 1800
 ctacactgaa caagatttat acaatcatgt catacctaag ccccgcaaca aaagagtacc 1860
 cattctctct tttgttattg gagcaggagt gctaggcgga gtagctactg gcatggcgcg 1920
 tatcacaaac tctactcagt tctactacaa actgtctcaa gaaactaaat gtgacatgga 1980
 atgggtgcct gataccctgt tcaacttgca agatcaact aactcctag cagcagtagt 2040
 ccttcaaaat cgaagagctt tagacttgct aaccgcggaa agcgggggaa cctttttatt 2100
 ttttagagaa aatgtctgtt gttatgttaa tcaatccgga atcatcacg agaaagttaa 2160
 agaaattcaa ggtcgaatat aacgttagagc aaaggagctg caaaacactg gaccctgggg 2220
 cctctcagc caatgtagc cctggattct cctcttcta ggcactctag cagctataat 2280
 attgttactc ccttttggac cctgtatctt taacctctt gttaaagttt tcttttccag 2340
 aatcgaaagca gtaaaactac aaatcgttct tcaaatggag ccccgatagc agtccatgag 2400
 taaaattctac caccggcccc tggaccggcc tgctagccca tgctctgat ttaatgacat 2460
 caaaggcacc cctcccagg aaatctcaac tgcacaacct ctactacgcc ccaattcagc 2520
 aggaagcagt tagagtgtt gttggccaac ctccccaa caagtgtgggt tttcctgtgt 2580
 agagggggga ctgagagaca ggaataacta gatttcttag accaactaag atccctaa 2640
 actagctggg aaggtgaccg cttccacctt taacaccgg ctttgcact tagctcaccg 2700
 ccaaccaatc agataactaa gagagctcac taaaatgcta attaggcaaa aacaggagat 2760
 aaagaaatag ccaatcatct gttg 2784

PCT/FR99/01513

<210> 5
 <211> 1799
 <212> ADN
 <213> Homo sapiens

<400> 5
 gggattctta gtcggcctag gaaatccagc taatcctgtc tctcagctcc ccactcaac 60
 aggaaaaacc aagtgtctgt ggggaggttg gctgacgacc agtctaactg ctctcctgcg 120
 aattggggca tagtaggggt tgtgcagttg agatttcctc gggaggggtg cgctcgata 180
 cattacaatt ggagcatggg ctatagggcc ggtccagggg tccacggtag atcttagtca 240
 tggacttcac ctgggggtcc atttgaagaa cgatttgtag cttacaact ttgattctgg 300
 aagagacaaa cttaacaagg aggttaaaga tacagggtcc aaagaggagt atcaattata 360
 gagctgtcag agatcctaag aagggggagaa tccagggcat ccattggctg agggagcccc 420
 aggggtctgtt gtttttgaag ctctctgttt ctacgttgtt ttcaatctcg aatttcttca 480
 actttctctg tgacaattca ggattgatta acataataac aacattcttc cgctaaaaata 540
 acataataac aacattcttc ccttaaaaat aaacagcttc cccctcttcc agaggttagc 600
 aagttctaag ctcttcaatt ttgaaggact actgatgcta ggaagtttaag ttgattcttc 660
 aaggtgacca gggagtcggc aaccctatcc atgtcccat ttgattcttc agatagtttg 720
 tagtagaact tagtagaggt tgtgggtacc ccaatgccag aacctagtc accctagcac 780
 cctgtcccca taacaaaagg aagaatgagt actctttgt tctgggggtt aggtacaaca 840
 taattgtata aatcttgttc agtgtaaatg gtcatggggg cactaagaat gagaggaagc 900
 acatagattc tgaagagcca ttcaacaac gataggctaa ggtaccacag acaaaaaata 960
 ttctgagggg taggcagact attcgtgttg gaggagttac ccactgatg cattgggagt 1020
 tggttgtgtc tacagtattg cttaaattta cacaggttag gtttgaggta tgggttatt 1080
 ccaagattga aacaagaggt cctaactaaa cggaagtggt gtttattct gtctgtagt 1140
 tgttccattg ttcaaggtaca gggattgaaa tgcattggct gaaatacagg gggagccaca 1200
 accaactact agtaggggtt tggaccgaga cctcatggag ccagtgagg ttggtataa 1260
 ataggcttac caggcaagta tgggtatgga gggtttcag tagttttaag agatctagtc 1320
 ctttgtaggg cttgaggggt ctatgtacc gggtcagttg ggaagtttat tctcttaact 1380
 gttttctct tgccctgact tgaactccac cccctccaga ctaaccagta tgggtgaagt 1440
 aagtcgcaga gacagtggct ccaagctctc caggacaact aggatatac attttccctg 1500
 tccaataatg agtatttgca tgcattgcaa gattggcaga gttatagcag ttgtggggca 1560
 tatgggtgtg ggcagtgaag gtggagtttc ctttaggtta acctctatt ttgtggggc 1620
 caattatttc ggggaagcgc attcttcata gaaactcttg ttaaggggag gatctgtgtg 1680
 tacagcagca tggagggggc gcagtgagag tgaagggggg taagagaaca gtaaaagaaa 1740
 aaatgatata agggagggcc atggggattt acgattttag ttactttctc accggttgt 1799

<210> 6
 <211> 1489
 <212> ADN
 <213> Homo sapiens

<400> 6
 tgggtcttgc cccgggcact ctacgtcctg ctgctggatc atctggttag tggcttctga 60
 ctacagaggac ctacgtcccc tggggcagtg ggcctacag tgaactccct gacacaggt 120
 gcatgagcga gggggcggtc tatttctatt tggacaatct tttttaaagt gtccctgtag 180
 accgcactgg aagcaaaacc tattagcatt ttgatttgcc tagcttttcc cttttccagt 240
 gccctcaaaag tccgcttgcc tgaggggcat gactaaagcg gtggcccttt ttttatccca 300
 tttgtcccat tctgcctgct catcctgata tctattataa aaaactgagg ttgccaaagt 360
 caataggggtt tctaagtttt gtcccgggcc taaggcagac ttttgaagtt ttttctaact 420
 gctctagact gactgagtga taaactatc ctttaagatt agttggcctt cagttagtc 480
 aggtgacaga gagaggtatg cttcctcaat gcctccgtta gctactccag aaaggcggt 540
 gatttttctt cctttccctg ttgtatagt gacatcatt aataactcac aggccttctt 600
 ctagtttttc tttagctctc tagcacgcaa gttagcaaat gtctcgccca ccaatctcca 660
 tgtctctgat ctgtctccca gtgaggggtc acactgggaa cctcctgctg gccctgtggg 720
 aatcgttctt tttcctctgt tctgcagcta tcatgtacct gactgagata ccagagatg 780
 ccaaaacttc aggtcgcagt tacggcgaca cttctgtcat ttgggggttag tgtctgatt 840

```

agcagtaaca ttatatctct ccatatcaga tcaaaggatt gtccataaac ttgtaaaaa 900
tcaatatagc catttagggt atctgagaat ttacctaggt ctattttaac ttaaagctcg 960
ggagagaaaa aggcacatgc actctggctg ggccgaatcc actgctgcc actgctgcc 1020
agagagaaaa aggtactctg actctggctg ggccgaatcc tctcccccac gctctggagg 1080
ggcataatcg gggaatatct gcatctcttg gttagtgttt taccctcttg tctatctctc 1140
ttgggaccgt ttgggttgaa ggggggtcct tattattttg ggaaggagtc tgggggagtc 1200
tggggtaggg aggttagactc tgagggtctc ctgtaggcca taaatcacac tttttacata 1260
attcgaggtt gtctcttaac gaaaagaaag tttgtacgta tgacacttca caccatttgc 1320
ctctctttct acaaaaggag tctagctgta agatgtgttt ataattttat ctctccctac 1380
gatgccaggt tctctccccc taaagagtat atcgttgcca ggcgttactc cagaagaata 1440
tgtctttttt tctcttagcat ctgagagtc aatttgtccc aattctcca 1489

```

<210> 7
 <211> 1216
 <212> ADN
 <213> Homo sapiens

```

<400> 7
taaagataca gggattgaaa tgtatggcct gaagtgcagg gtcataatag tgtgggtggt 60
gaaaattggg tttcccttag aaaaactcct atacgatggg tcatcaatat ttccaggaa 120
ccgcatcttc catagaaact ctgggtaaat ggagctactg gtatcacagt ggcatggagg 180
gggtgcagtg agagtgaag agggtaaaag aacagtaaa agaaaaatat tataaggag 240
gggttcagtg agagtgaag ggggtaaag aacagtaaa aaaaaatat gacaaggagg 300
gccatgagga tctacgattc tagttacttt cctcacggtt gtccgttgaa gagcaggtgc 360
agatcctcta gaggttcaca ggaatagcta gcgttgtctc ctggattttc gggttctctt 420
ggcagtaaac agagtgtgac tctagtgta tgtattcaag actccactcc agccacttta 480
accgcagttg gggtagataa aatgactggg tagggctcct cccaggtatc atccaaggat 540
ggggaactag aaggaaggga cttgactaat accatgtcac caggggtcaa taactacttt 600
ccctcttctc ggggaacagg tccctgtaat gttttaagaa cttgttgata tttggccaag 660
gaggtgatgt ctgcaactaa gctggccatc tctcggtcaa gcacaaggct cttggttagg 720
aaggggcctc catcacagcat tttgtatggg ctaagtctct ctttttggg agagttttgg 780
attcttagta aggctgtagg caacagagca ggccatgcaa ggtgggtttc tgggttagc 840
ttttttaaat tgcgttttag tgcttcattc attttctga cttttctga ggtatttggc 900
ctccacggcc agtgaagtg atattgtatg cctaagcctc gggaactctc ctgggttact 960
gtagccttga aaacggggcc attgtcactc tgtaagcctc ggggaagtcc gaactggga 1020
attatttcat gaattagtc ctttattaca tcttggtcct tttctgtcct acaaaggag 1080
gctctgcgcc aaccagtgaa aatatctacc cagactagta gatactgaaa tccctgagat 1140
ttgggcatgt gggtaaaatc tagttgccag tcttctcctg agtaattggc tgtctttgt 1200
tctctgaag gactct 1216

```

<210> 8
 <211> 976
 <212> ADN
 <213> Homo sapiens

```

<400> 8
agtataatg gaatacttga aagtaatccc ctccactcag gaactagtgc tgagctggcc 60
aaactaatag cctctactcg ggcactagaa ttaggagaag agaaaagggt aaatatatat 120
acagactata agtatgctta cctagtctct catgcccatac cagcaaatatg gagagaaa 180
gaattcctaa cttccaaaag aacacctata aaactctagg aagccattag gatattatta 240
ttggttgtag aaaaacctaa agagtgggca gtccctacac ctgtgggttca tcagaaaaaa 300
aaggaaggag caatgaaggg gaactaccaa gcagatattg aagccaaaaa agcccgaa 360
caggacccctc cattagaagt gcttatagaa ggacccctag tgtgggtgtt accctccag 420
gaaagcaatc cccagctactc agcaggagaa ataaaaatga gaacctcac aggcatacat 480
ttctctccctc cagggtggct agccaccaaa gaaggaaaaa tgcttttggc tgcagctaac 540
caatggaat tacttaaaac ccttcaccaa accttctact taggattgat agcaccctac 600

```

agatggccaa	attattattt	actggatcag	gccttttcaa	aactatcaag	caggtagtca	660
gggcccgttaa	agtggtgccaa	agaaataatc	tcctgcactg	caagccatcc	atttcaatcc	720
ctgtatcttt	aacctccttg	ttaagtttgt	ctctccagca	atcāaagctg	tāaaactaca	780
aatggttttt	caaatggagt	ctcagatgca	gtccatgact	aagatatacc	gcacccccct	840
ggaggggccc	tgctagccca	tgctccaatg	ttaatgcacat	cgaaggcacc	cgctccgggg	900
aaatctcaac	tgcacacccc	ctactatgtc	ccaattcagc	aggaagcagt	tāaagcggtc	960
atcggccaac	ctcccc					976

<210> 9
 <211> 942
 <212> ADN
 <213> Homo sapiens

<400> 9						
agaggagAAC	agcagcataa	gcggtctgca	gaggtaggga	aagaccagca	agaagaaaag	60
agagaaagag	aaagagaaag	tcagagaaaag	agacagagag	aggaagagac	aaagagacag	120
aaagtcaaaag	aggttagtgt	cagaacacaga	gacaaaaaaa	aggagtgcga	aagagggaca	180
gacacagaaa	gtcaaaaaaa	aagttaagaa	gaagggaaaa	gacaaagaa	aagtgcgaaga	240
ggagaaagag	agagatagaa	gtagttaaga	aaaaaacagc	atatcccatc	cctttaaagc	300
cagggttaaat	ttctatctac	ccagccaaag	catattctac	ttatgtggat	cttcaaccca	360
tatctgcctc	tcagacagt	tgcaagaaat	aatgaatctc	atccttactc	tacaattcca	420
aatgaactct	ttggcgacag	tgactctcca	aaactgcaga	ggcctagacc	cttccactgc	480
tgaaaaagga	ggacactaca	ccttcttagg	ggaagaatgt	tgtttttaca	ctaaccagtc	540
ggggatagta	tgagatagtc	ccccgagttt	acagagaaag	gcttctgaaa	tcagacaacg	600
cctttcaaat	tcttatacca	acttctggag	ttaggacaaca	tggtctctcc	ccttctcagg	660
tcctctggca	gcactcttgc	tgttactcgc	ctttggggcc	tgatttttta	accctcttgt	720
caaattttgt	tcctctagaa	tcgaggccat	caagctacag	atggtctttac	aaatggaacg	780
ccaaaagagt	tcaactaaca	acttctacag	aggaacccct	gtcacaaccca	ctggcacttc	840
cctctggcta	gagagtctcc	ctctgaagga	caccycaact	gaggggacct	tctttggccc	900
atccagcag	agtagctaga	gtggtcatcg	gccaaattgc	ca		942

<210> 10
 <211> 1375
 <212> ADN
 <213> Homo sapiens

<400> 10						
ccccaatatt	ctctttctga	tggggaaaaa	tgggccacctg	aggggaagcac	aaattacaat	60
actatctcgc	agcttgatct	tttctgttaag	agggaaggca	aatggagtga	aataccttat	120
gtccaagctt	ctcttttcaat	gagggagaaat	acacaactat	gcaaaagcttg	caattttacat	180
cccacaggag	gacccctcag	cttaaccacca	tctcttagcc	tcctctatagc	ttccctctctc	240
attgatgata	ctctctctct	aatctccctc	gcccagaaag	aaataagcaa	agaaatctcc	300
aaaggtccac	aaaaaccccc	gggctatcgg	ttatgtcccc	ttcaagctgt	agggggagggg	360
gaattttggcc	caaccgggtg	gcattgtcccc	ttctccctct	ctgattttaaa	ccctgggctc	420
cagacctcgg	gaagttttca	gatgatcctg	atagctacat	agatgtctca	cagggtctag	480
ggcaaacctt	tgactcaact	tggagagacg	tcaatgctac	gttagatcaa	acccctggcct	540
ttaatgaaa	gaatggcggt	ttagctgcag	cctgagagtt	tggagataacc	tggtatcccta	600
gtcaagttaa	tgaagaagatg	acagccgaag	aaagggcacaa	cttccctact	gtctcagcaag	660
ccatccccag	tatggatccc	cactgggact	ttgactcaga	tcatggggac	tggagtgcga	720
aaacatctgt	gatctgtgtt	ctggaaggac	taaggagaat	tggaaaaaag	cccatgaatt	780
attcaatgat	attccaccata	accacgggaa	aggaagaaaa	tccttctgcc	ttctctgagc	840
ggctacaaga	ggcctctaga	aaataatact	ccctgtcacc	cgaatcactc	gaggttgcaat	900
tgattctaaa	agataagttt	attaccat	cagccacaga	tatcaggaga	aagctccaaa	960
agcaagccct	gagccctgaa	caaaaatctag	agacattatt	aaacctggca	accttggtgt	1020
tctataatag	ggaccaagag	gaacaggccc	aaaaggaaaa	gcgagatcag	agaaaaggcg	1080
cagccttagt	catggccctc	agacaaacaa	accttggtgg	ttcagagagg	tcagaaaaatg	1140

gagcaggcca	atcacctggt	acggcttgtt	atcagtgcgg	tttactagga	cactttaaaa	1200
aagattgtcc	aataagaaac	aagctgcccc	ctcatccgtg	tccactatgc	cgaggcaatc	1260
actggaaggt	gcactgcccc	agaggatgaa	ggttccctgg	gttagaagcc	cccaaccaga	1320
tgatccaaca	acaggactga	gggtgccccg	ggcaagcacc	agctcatgtc	atcac	1375

<210> 11
 <211> 944
 <212> ADN
 <213> Homo sapiens

<400> 11

acctaggagg	aactgtcttc	aggacaggac	tatagatgct	tcctcccagg	cgattaaggg	60
aaaaagacac	aatgggtatt	cagtaagtga	taaggaaact	cttgtagaag	cagaggttag	120
aaaattgcct	aataattggt	ctgctcaaat	gtgcgagctg	tttgcactca	gccaaacctt	180
aaaagtatta	cagaatcagg	aagaagccat	ctataccaat	tctaagttaa	tatggactga	240
acgagaactt	attaatagca	aagaataatt	gaatcccaa	acttacaagg	ttttcaacaa	300
aagcacagtt	tgctaaaagt	taactgtgta	acatgtatta	tcctactacc	acaaactctc	360
aaatgatttc	tcagacagtt	tgcaagaaac	aatgaaacct	atccttactc	tacaatcccc	420
ataagactct	ttggcagcag	tgactctcca	aaaccaccaa	ggcctagacc	ctctcaactc	480
tgagaaaaag	ggactctgca	cctctctagg	ggaagattgt	gttttttaca	ctaaccagt	540
agggataatg	tgagatggca	cccagcgttt	acagaaaaag	gctcttgaaa	tcagacacaa	600
tgctttttca	acctttatag	aacctctgga	gttcggcgac	tggtctttcc	ccttctctagg	660
tcctgtgaca	gccactctgc	tattactcgc	cttcggggcc	tgatttttta	acctctctgt	720
caaatgtgtt	tcctctagga	tcgaggccat	caagctacag	atggtctctac	aaatgaaacc	780
ccaaatgagc	tcgactaaca	acttctactg	aggaccctgt	gaccgaccca	ctggccctct	840
aaactggctt	aagagtttcc	ctctgggaga	cactacaact	gcaggggccc	ttctttggcc	900
catccacagg	aagtttagct	gagcagtcac	caccacaatc	ccaa		944

<210> 12
 <211> 963
 <212> ADN
 <213> Homo sapiens

<400> 12

tcaggaagcc	ccataatagc	tccttggcaa	attctattca	gtccaactg	ctaggagtgg	60
cccattttgt	ctgaaccctc	aaatcatggg	aatgagaat	gaatttagac	tgaccacagc	120
ctcttatgag	tttcagctac	aggggtgtat	agaaccctga	taaggagtgt	tcctttgtgt	180
tggaagatcc	ttctatattt	gcctccccc	caactggaca	ggaacttgta	ctttagccta	240
catagttact	cctgtgactt	atccttttca	gaagaggcag	tagctgtgcc	cattcatgct	300
aagcttcagc	cgagagcaat	ctcactactt	cctctattgg	ctgggttagg	atttactacc	360
accttaggaag	tggaactaca	gcctagatga	aatctctctc	caacttactc	aaatccagga	420
ccaaatagac	tcattagcag	ctgtggttct	ccgaaccagt	gagcactaga	ttccaaatct	480
ctctactgcc	gaaaggggag	gaacatgcct	ttttctgaac	aaggaatgtt	gtttttatgt	540
caataaatca	ggcatagtga	gagatggaat	taaatgactt	caggatagag	ctcagcagct	600
acatgtgggg	acaaaccgaa	ctacctcagg	gttctcacag	cctgtctccc	actggcttct	660
tcatttttta	ggtccctctc	ttatgattat	tctaggagta	acctttggcc	catgtctttt	720
cagttctctc	atcctttcgt	ttctctctga	atagaatcaa	tgaactaga	aatgttactg	780
cagatggaaac	ctcagatgac	ttcaaccagc	acctattatc	aaggaccctc	aaaccagcct	840
gccggcccat	accggcagct	tgacacccaa	accacctctc	acgaggaaac	ctcagctaca	900
gaaccctctc	tatgccccta	ttcagcagga	agcaattaga	gtggtcatcc	ttccacaccc	960
caa						963

<210> 13
 <211> 1362
 <212> ADN
 <213> Homo sapiens

<400> 13
 ccacaaatc ctcttccagg aggagaacga tggccacotg aggggaagt acactataat 60
 accatctctg aactagatct gttttgtaaa caagaaaggca agtggattta ggtaccatat 120
 gttcagacct tttctcatt aagggatgat aaccacagat tgtgtaagac atgtaacctg 180
 caccocacag ggagttctct aattctaccc ccataccocag tctctccccc ggctctctct 240
 actaatgcc aaccctctct ggcttctaca gcccaaaagg gaacaaataa aagagccttc 300
 agagagccaa gagacccccc tggccctctg ctatgtctct ttcaggctgt aggaggggaa 360
 tttggcccaa cccgagtaca tgttcccttt tctctctctg atctaaagca aattaaggca 420
 gacttgatg aaagtctctc gatgaccccc atagatacgt agatggccct ctgggtctcg 480
 gacaatcttt tgacctttcc tggagagaga tcatgttatt gcttgatcag acctaacctc 540
 taatgagaag aatgctgctt taacaggagc ccgagagttt ggggataacct ggtacctcag 600
 ttaagttaagt gatagaatga catcagaaga gacgagtttc ctactggcca gcaagcagtc 660
 cccgatatgg atccccactg ggacctctgac tcggatcatg gggactggag tcacaaacat 720
 ttactgacct gtatcctaga agggtttaagg agaactagga aaaagcccat gaactattca 780
 atgatgtcta ctataaccca agggaaaggaa gaaaacccca ttgccttctc caaaaggctg 840
 agggaggctt tgagaaaata tactccccctg tcaccagatt ccctcgaaagg ccagttaatt 900
 ttaaaggaca aatttattac tcatgcagct gcagacatta ggaaaaagct ccaaaagtta 960
 gccctggggc tcagcaaaatt tggaggcctc attaaacctg gcaacctcag tttctatca 1020
 tagggaccaa gaggaacagg ccgaaaaggga aaagcaggat aagagaagg ctgcagattt 1080
 agtctacccc tcagacaacac ctggccggtt caaagaggag aaaaatgga gaggccaatt 1140
 caccocagcag ggcttattat cagtgcagtt tacaaaggca ctttaaacaa gatgttccaa 1200
 agagaaaata gccgcctctc caccatgtc cactatgcca aggtgatcac tgggaaggac 1260
 actgtccccag aggacaaaagg ttctctgggc cagaagctccc caaccagatg atccagcaac 1320
 aggatggagg gtgcccgggg caagcaccag ctctgttgtt ca 1362

<210> 14
 <211> 945
 <212> ADN
 <213> Homo sapiens

<400> 14
 ttgcagatca atctcagact gctgtgctag caatgagtga ggcttctgtg gcatgggacc 60
 ctctgagcca ggcattggat ataattgctt tgtgtgccat ttgctaagac tgttggaaata 120
 gcacagtatt aggggtggag ttgcccgatt ttccaggtgc tgtctgtcac cgcttccctt 180
 ggttaggaaa gagaattccc tgaccccttg tttcttccag gtaaggcagt gcctcaccct 240
 gcttcagctc acactcaggt gactgcacccc actgtctctc ccccactgtc ggacaaggccc 300
 cagtgagatg aacctggtac ctccagttgga aatgcagaaa tcacctgtct tctgcgtcac 360
 tcacactggg agctgtagac tggagctgtt cctatttggc catcttggaa ccatctccca 420
 aatagactct ttggcagcag tgactctcca aaaccacca ggccctagacc tctcatttgc 480
 tgagaaggga ggaactctga ccttcttagg ggaggagtgt gtttttata ctgaccagtc 540
 agggtaggta cgagatggca ccgatgttt acagggaaa gcttctgaaa tcacacaaca 600
 cctttcaaac tcttatacca acctctggag ttgggcaaca tggcttctcc ccttctctgg 660
 tcccattgca gccattctgc tattactcgc ctccagctgt tgtattttta acctccttgt 720
 caaattttgt tctcttagaa ttgaggccgt caagctacag atgttcttac aaatgggacc 780
 ccaaatgagc tcaactaaca actctcgcca aggaccctg gaccaaactg ctggcccttt 840
 cactggcctt aagagttccc ctctggagg cactacaact gcaggggccc ttcttggccc 900
 ctatccagca ggaagttagct agagcagtc taccaccaat cccaa 945

<210> 15
 <211> 939
 <212> ADN
 <213> Homo sapiens

<400> 15
 agagctacct tggcaagtag tctaggagta tgggaaaatg aaaaacaaca actcacacac 60
 catttttaaca tacacaatca ggtctgcccc ccagcgaagg tatattcttt gtatgtggaa 120
 catcgaccta tatctgcttc ccactaact agacagccac ctgaatctta gtctttctaa 180
 gtcccccaag taacattgct ccaggaatc agaccatata agtatccctc aaagctcaag 240
 tctgtcagtg cagagccata caactaata ccctacttat agggtaagga atggctactg 300
 ctacaggaac cagaatagct agtttgttta ctctattatc ctactaccac acactctcaa 360
 atgattcttc agacagtttg caagaataa cgaatcttat ccttactcta caatcccaaa 420
 tagactcctt ggcagcagtg accctccaaa acggctgagg cctagacctc ctactgccaa 480
 agaaaggagg actctgcatt ttcttagggg aagagtgttt ttacactaac cagtcaaggga 540
 cagtatgaga tgccactcgg agtttacagg aaaaggcttc tgaagtcaag caatgccttt 600
 caaactctat accaaaactc ggagttgggc aacatggctt ctcccctttc taggtcccc 660
 gacagccatc ttgctattat ttgcttttga gccctgtatt tttaatctcc ttttcaaaa 720
 tgtttctctt ggatcgaggc caatcgagta cagatgtgct tcacaaatgg aaaccccaaa 780
 gagctcaact aacaactctt actgaggacc cctggactaa cctgctgacc ctctcactgg 840
 cctgaagaat tccctctgag aggcactacc aactgcaggg ctctctcttt gccctctacc 900
 agcaggaagt agctagagct gtcattgctt aattctcaa 939

<210> 16
 <211> 979
 <212> ADN
 <213> Homo sapiens

<400> 16
 agtgataatg gaatacttga aagtaatccc ctactcctcc aggaactagt gctcagctgg 60
 cagaactaat agccctcact cgggtactag aatcaggaga aggaaaaagg gtaaatatat 120
 atacagactc taagtgtgct tacctagtcc tccatgcccc tcagcaata tggagagaaa 180
 gggaattcct aactctcgag ggaacacctc tcaaacatca ggaagccatt aggaattat 240
 tattggctgt acagaaacct aaagagggtg cagttttaca ctgccccggg catcagaaa 300
 gaaaggaaag ggaatacaaa gggagccacc aagttgatat tgaagtcaaa agagccacaa 360
 ggctggacc cccattagaa atgcttatag gaggaccctt agtatgggtt aatccccctc 420
 gggaagccaa gccccgatc ctacgaggag aatatagata ggggaactca tgaggacata 480
 ctccctctcc ctccagatgg ctagccacca ataaaggaaa aataactttt cctgcagcta 540
 accaatagaa attacttaaa accctctc ctaaccttcca cttaggcatt gatagcacc 600
 atgagatggc caaattatta ttactggac caggcccttt caaaactatc aagcagatag 660
 tcagggcctg taaagctctg caaagaaata atccctctga ctgcaggcca tacatttcaa 720
 tccctgtatc ttttaacctc ttcttaaat tgtctcttcc agaatacaag ctgtaaaatt 780
 acaaatagtt ctccaattgg agccacagat gcagtcocat actaagatcc accacagacc 840
 cctggaccag cctgctagcc catgctccaa tgttaatgac atcgaaggca cccccctctg 900
 aggaatactc aactgcacaa cccctactac gcccaattc agcagaaagc agttagatg 960
 gtcacagcc aacctcccc 979

<210> 17
 <211> 1774
 <212> ADN
 <213> Homo sapiens

<400> 17
 catgctggta aaggaccgct agaatccagc agccaggacc actttctttt tgggtcaaga 60
 aggtggggaa acaggtgcag gactgttaca ctggtaagca taactaatcc gataagcaga 120
 ggtccatggg tggttacgca ccttggaagg gaataagcat taggactata gaggacactc 180

taggactaat	gctcatcgga	aaatgactag	gggtactggc	atccctatgt	tcttttttca	240
gatgggaaat	gttcccccca	aggcagaaat	gccccataaga	tgtattcttg	agaaaatggga	300
ccaactctgc	cctcagacac	taagaaagaa	atgactttata	tcttctctga	gtaccacctg	360
gccacaatat	cttcttcaag	gggcagaaac	ctggcctctct	gagggaaagta	taaatattata	420
caccacttta	cagctagagcc	tctttttag	aaaagaaggc	aaatggagtg	aagtggccata	480
gtacaaaact	tctttttcat	taagagataa	ctcccaatta	tgtaaaaagt	gtgattttat	540
ccctacagga	agccctcaga	gtctacctcc	cgacccccagc	aagaccoccaa	ctccttctcc	600
aaactaataag	gacccccctt	caaccccaat	gggtccaaaag	gagatagaca	aaggggttaa	660
caatgaacca	aagagtgcca	atattacacg	attatactcg	ctccaaagcag	tgggaggaga	720
attttggccca	gccagcgtgc	atgtaccttt	tctctctcta	gattttaaagc	aaattaaaaat	780
agaccttaggt	aaattctcag	ataacccctga	tggctatat	gatgttttac	aaggggttagg	840
acaactcttt	gatctgacat	ggagagatat	aatgttactg	ctaaatcaga	cactaaacccc	900
aaatgaaaaa	agtgtctgcca	taacagcagc	ctgagagttt	ggcgaactct	ggatatctcag	960
tcagggtcaat	gataggatga	caacagatga	aagagaatga	tccccccag	gccagcaggc	1020
agttcccgat	gtagaccctc	attaggacac	agaatcagaa	cttggagatt	ggtgccacag	1080
acatttgcata	acttgcgtgc	tagaaggact	aaggaaaaat	aggaagaagc	ccatgaatta	1140
ttcaatgatg	tccccataaa	cacagggaaa	ggaaagaaaat	ccctactgct	ttctggagag	1200
actaaggaaa	ggattggaga	agcatacctc	cctgtcacct	gactctatta	aaggccaact	1260
aatcttaaaag	gataagttta	tcactcagtc	agctgcagag	attaaagaaa	aaagctaaaa	1320
gtatgcctta	ggcccagagc	aaaacttaga	aacctactgc	aacttggcaa	cctcagtttt	1380
ttataataga	gatcaggaag	agcaggggaa	tgggacaaat	gggataaaaa	aaaaaaaaaa	1440
aggtgactgc	tttagtctgt	gccctcaggc	aaatggactt	tggaggctcc	agaaaaggga	1500
aaagctgagc	aaatttgaat	cctaacaggg	cttgcctcta	gtgtggtcta	caaggacact	1560
ttaaaaaaga	ttgtccaagt	agaaaacaag	tgcccccttg	tccatgcccc	ttatgtcaag	1620
ggaatcactg	gaaggccac	tgccccagga	gatgaaggtc	ctctgaqtca	gaagccacta	1680
accagataat	ccagcagcag	gactgaggat	gcccaggcca	agcgcagacc	catgccatca	1740
ccctcacaga	gccttgagga	tgcttgacca	ttga			1774

<210> 18

<211> 938

<212> ADN

<213> Homo sapiens

<400> 18

tgtaggaga	actcccttca	ggacaggaca	atagatgggt	cctccagggt	gattaaggaa	60
aaaagacaca	gtattcagta	agtataaagg	aaactcttgt	agaagcagag	ttagaaaaat	120
ggcctaataa	ttggctctgt	caaattgtgt	agttgtttgc	actcagccaa	actctaaagt	180
acttcacagaa	tcagggaagca	gccatctata	ccaattctaa	gttaatatgg	actaaacag	240
gtttttatag	tagcaaaagaa	aaattttaa	cccaacttta	caaggttttc	aactaaagt	300
tcgcaaaaagt	taacagtgt	acatgtatta	tctactatc	acacactctc	aaaggatttc	360
tgcagacagtt	tgcagaagaat	aacgttaatc	atcttacttc	tacagtccca	aatagactct	420
ttggttagcag	tgaactctcca	aaactgcgga	ggtctagacc	tcttcaatgc	tgagaaagga	480
gaactctgca	cttctcttag	ggaagagtcg	gtttttttaca	ctaacccagtc	agggatagta	540
tgaagtactg	cctgcagttt	acaggaaaaa	gcttctgaaa	tcagacaacg	ccttcaacgc	600
tcttatacca	acctctggag	ttgggcaaca	tggctctctc	ccttgcctag	tctctggga	660
gccactctgc	tattacttgc	cttcggggccc	tgtattttta	acctcctgtg	caaatttgtt	720
tcctctctga	tcaaggccat	caagctacag	atggtcttac	aaatggaaac	ccaaatggag	780
tcaactaaca	acttctactg	aggacacctg	gactgaccaca	ctggcccttt	cactggccta	840
aagagttccc	tcttggagga	cactacaact	cgaggggccc	gtcttcaccc	ctatccagca	900
ggaagttagct	agatcagtca	tggcccaatt	ccaacacg			938

<210> 19

<211> 1308

<212> ADN

<213> Homo sapiens

<400> 19
 gatgcttgcc ccaggcacc tca gtcctgt tgttgatca tctggtcgg ggctctctggc 60
 ccaaaagacc ttgtctctt gaggcagtg accttccagt gattgctcca gacttggtga 120
 catgggcaag ggggcagctt gttctcact ggacaactct ttttaagctg tccctcccaa 180
 ccacactggg aacaagccct accagggtgat tggcctgctc tattttctgt cctctctgaa 240
 ccaccaaggt ttgtctgtct gagggtcatg actaaggctg tggcctttct ctgactctgc 300
 ttttctcttt tggcctgttc ctcttggtac ctattataga acactgaggt tgccaggttt 360
 aacaatggct ccagattttg ttccaggcacc agggctcatt ttggagcttt cctctgatat 420
 ctgcagctga ttgggtaata aacttatctt ttaggatcaa ttgactctca agagagtgg 480
 gtgacagggg agtatatttc cttgaggcct cccatagccg ctctaggaag gcagaaggat 540
 tttctctctt tccctgagtt ataaaagaca caattgaaca accatggac ttttcccaa 600
 ttctcctgtag tctctctaga acacaggctc gacagtggtt acgactccag tcccatagt 660
 ctgagcttag acaccagtg ggatccatc tggggatggc ctgctgactg gtagggaatt 720
 tgtcctcttc tttggctgtc attctatcat ttacttgact aagataccaa gtactctcaa 780
 attctcaggc tgcagctaaa gctgcattct ttctattaaa ggcagggtt tgatctaata 840
 gcatgacatc tctccaagt aggtcaaagg tttgccctag atccatagga catcagagaa 900
 ggagaagggg acatacacct gagttagcca aattcccctc cctctacagc ttgaaggga 960
 cataagcaat agcctgggga tttttgtggt ccttgggaga ttctttgtct tgttctctc 1020
 tgggtggggg agattagagg aggtttatca gtaataggaa ggggagctat agggaggcta 1080
 ggatattggg gtaagctgag aggtcatctt gtgggatga aattgcaagg ttgtcatagt 1140
 ttgtgatttt ccttacaatg aaaaataaagc ttggacataa ggtatttccac tccattggc 1200
 ttccctctta gcagaaaggc caagctgcag gatagtaact taattttatc ttctctcag 1260
 tggccatttc tcccatcag agagagaata ctgggctgg gccatagt 1308

<210> 20
 <211> 711
 <212> ADN
 <213> Homo sapiens

<400> 20
 actgagagac agggactagct ggatttcccta ggcgactaa gaatccctaa gcttagctgg 60
 gaaggtgacc acgtccacct ttaaacacgg ggcttgcaac ttagctcaca cctgaccaat 120
 cagagagctc actaaaaatgc taattaggca aagacaggag gtaaaagaaat gccaatcat 180
 ctattgctgt agagcacagc aggagggaca acaatcggga tataaaccca ggcattcgag 240
 ctggcaacag cagccccctt ttgggtccct tccctttgta tgggagctgt ttcatctga 300
 ttctactcta ttaaatcttg caactgcact cttctggctc atgtttctta cggtcgcagc 360
 tgagcttttt ctacagctcc accactgctg tttgccacca ccgagacct gccgctgact 420
 cccatccctc ttgactcctgc aggtgttcgc ctgtgctctc gatccagcga gggcccatt 480
 gcgcctccca atttgggttaa aggtttgcca ttgttctgc acggctaagt cctgggttt 540
 ttcttaattg agctgaacac tagtcaactg gtccatgtg tctcttctgt gaccacaggc 600
 ttctaataga actataacac ttaccacatg gcccaagatt ccatcctgt gtaaccgtga 660
 ggccaagaac tccagggtcag agaatacag gcttgcacc attcttgaag c 711

<210> 21
 <211> 711
 <212> ADN
 <213> Homo sapiens

<400> 21
 actgagagac agggactagct ggatttcccta ggcgactaa gaatccctaa gcttagctgg 60
 gaaggtgacc acatccacct ttaaacacgg ggcttgcaac ttagctcaca cctgaccaat 120
 cagagagctc actaaaaatgc taattaggca aagacaggag gtaaaagaaat gccaatcat 180
 ctattgctgt agagcacagc aggagggaca atgactcggga tataaaccca agtcttcgag 240
 ccggcaacag cagccccctt tgggtccctc ccttctgtat gggagctctg tttcatctg 300
 atttcaactc attaaatctt gcaactgcac tctctggctc catgtttctt accgcttgag 360
 ctgagcttcc gctgcacatc caccactgct gtttgcgcgc accgcagacc ccgcgctgac 420

15

```

tccatccct ctggatcatg cagggtgtcc gctgtgtccc tgatccagcg aggcacccat 480
tgccgtcccc aatcgggcta aaggcttgcc attgttccgt catggctaag tgcctggggt 540
catcctaatt gagctgaaca ctagtcaact gggtccatgg ttctcttctg tgacccacag 600
cttctaatag agctataaca ctcaccgcat ggcccaagggt tccattccct gaatccataa 660
ggccaagaac cccagggtcag agaacacgag gcttggccacc atcttgggag c 711

```

<210> 22
 <211> 2055
 <212> ADN
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(2055)

<400> 22
 ccc aag aca gcc aac tta gtt gca gac atc acc tcc tta gcc aaa tat 48
 Pro Lys Thr Ala Asn Leu Val Ala Asp Ile Thr Ser Leu Ala Lys Tyr 15
 1 5 10 15
 caa caa gtt ctt aaa aca tta caa gga acc tat ccc tga gaa gag gga 96
 Gln Gln Val Leu Lys Thr Leu Gln Gly Thr Tyr Pro Glu Glu Gly 30
 20 25 30
 aaa gaa cta ttc cac cct tgt gac atg gta tta gtc aag tcc ctt ccc 144
 Lys Glu Leu Phe His Pro Cys Asp Met Val Leu Val Lys Ser Leu Pro 45
 35 40 45
 tct aat tcc cca tcc cta gat aca tcc tgg gaa gga ccc tac cca gtc 192
 Ser Asn Ser Pro Ser Leu Asp Thr Ser Trp Glu Gly Pro Tyr Pro Val 60
 50 55 60
 att tta tct acc cca act gcg gtt aaa gtg gct gga gtg gag tct tgg 240
 Ile Leu Ser Thr Pro Thr Ala Val Lys Val Ala Gly Val Glu Ser Trp 80
 65 70 75 80
 ata cat cac act tga gtc aaa tcc tgg ata ctg cca aag gaa cct gaa 288
 Ile His His Thr Val Lys Ser Trp Ile Leu Pro Lys Glu Pro Glu 95
 85 90 95
 aat cca gga gac aac gct agc tat tcc tgt gaa cct cta gag gat ttg 336
 Asn Pro Gly Asp Asn Ala Ser Tyr Ser Cys Glu Pro Leu Glu Asp Leu 110
 100 105 110
 cgc ctg ctc ttc aaa caa caa cca gga gga aag taa cta aaa tca taa 384
 Arg Leu Leu Phe Lys Gln Gln Pro Gly Gly Lys Leu Lys Ser 125
 115 120 125
 atc ccc atg gcc ctc cct tat cat att ttt ctc ttt act gtt ctt tta 432
 Ile Pro Met Ala Leu Pro Tyr His Ile Phe Leu Phe Thr Val Leu Leu 140
 130 135 140
 ccc tct ttc act ctc act gca ccc cct cca tgc cgc tgt atg acc agt 480
 Pro Ser Phe Thr Leu Thr Ala Pro Pro Pro Cys Arg Cys Met Thr Ser 160
 145 150 155 160

agc tcc cct tac caa gag ttt cta tgg aga atg cag cgt ccc gga aat 528
 Ser Ser Pro Tyr Gln Glu Phe Leu Trp Arg Met Gln Arg Pro Gly Asn
 165 170 175

att gat gcc cca tgc tat agg agt ctt tct aag gga acc ccc acc ttc 576
 Ile Asp Ala Pro Ser Tyr Arg Ser Leu Ser Lys Gly Thr Pro Thr Phe
 180 185 190

act gcc cac acc cat atg ccc cgc aac tgc tat cac tct gcc act ctt 624
 Thr Ala His Thr His Met Pro Arg Asn Cys Tyr His Ser Ala Thr Leu
 195 200 205

tgc atg cat gca aat act cat tat tgg aca gga aaa atg att aat cct 672
 Cys Met His Ala Asn Thr His Tyr Trp Thr Gly Lys Met Ile Asn Pro
 210 215 220

agt tgt cct gga gga ctt gga gtc act gtc tgt tgg act tac ttc acc 720
 Ser Cys Pro Gly Gly Leu Gly Val Thr Val Cys Trp Thr Tyr Phe Thr
 225 230 235 240

caa act ggt atg tct gat ggg ggt gga gtt caa gat cag gca aga gaa 768
 Gln Thr Gly Met Ser Asp Gly Gly Gly Val Gln Asp Gln Ala Arg Glu
 245 250 255

aaa cat gta aaa gaa gta atc tcc caa ctc acc cgg gta cat ggc acc 816
 Lys His Val Lys Glu Val Ile Ser Gln Leu Thr Arg Val His Gly Thr
 260 265 270

tct agc ccc tac aaa gga cta gat ctc tca aaa cta cat gaa acc ctc 864
 Ser Ser Pro Tyr Lys Gly Leu Asp Leu Ser Lys Leu His Glu Thr Leu
 275 280 285

cgt acc cat act cgc ctg gta agc cta ttt aat acc acc ctc act ggg 912
 Arg Thr His Thr Arg Leu Val Ser Leu Phe Asn Thr Thr Leu Thr Gly
 290 295 300

ctc cat gag gtc tgc gcc caa aac cct act aac tgt tgg ata tgc ctc 960
 Leu His Glu Val Ser Ala Gln Asn Pro Thr Asn Cys Trp Ile Cys Leu
 305 310 315 320

ccc ctg aac ttc agg cca tat gtt tca atc cct gta cct gaa caa tgg 1008
 Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp
 325 330 335

aac aac ttc agc aca gaa ata aac acc act tcc gtt tta gta gga cct 1056
 Asn Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro
 340 345 350

ctt gtt tcc aat ctg gaa ata acc cat acc tca aac ctc acc tgt gta 1104
 Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val
 355 360 365

aaa ttt agc aat act aca tac aca acc aac tcc caa tgc atc agg tgg 1152
 Lys Phe Ser Asn Thr Thr Tyr Thr Thr Asn Ser Gln Cys Ile Arg Trp
 370 375 380

gta act cct ccc aca caa ata gtc tgc cta ccc tca gga ata ttt ttt Val Thr Pro Pro Thr Gln Ile Val Cys Leu Pro Ser Gly Ile Phe Phe 385 390 395 400	1200
gtc tgt ggt acc tca gcc tat cgt tgt ttg aat ggc tct tca gaa tct Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Ser Glu Ser 405 410 415	1248
atg tgc ttc ctc tca ttc tta gtg ccc cct atg acc atc tac act gaa Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu 420 425 430	1296
caa gat tta tac agt tat gtc ata tct aag ccc cgc aac aaa aga gta Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val 435 440 445	1344
ccc att ctt cct ttt gtr ata gga gca gga gtg cta ggt gca cta ggt Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly 450 455 460	1392
act ggc att ggc ggt atc aca acc tct act cag ttc tac tac aaa cta Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu 465 470 475 480	1440
tct caa gaa cta aat ggg gac atg gaa cgg gtc gcc gac tcc ctg gtc Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val 485 490 495	1488
acc ttg caa gat caa ctt aac tcc cta gca gca gta gtc ctt caa aat Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Val Leu Gln Asn 500 505 510	1536
cga aga gct tta gac ttg cta acc gct gaa aga ggg gga acc tgt tta Arg Arg Ala Leu Asp Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu 515 520 525	1584
ttt tta ggg gaa gaa tgc tgt tat tat gtt aat caa tcc gga atc gtc Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val 530 535 540	1632
act gag aaa gtt aaa gaa att cga gat cga ata caa cgt aga gca gag Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu 545 550 555 560	1680
gag ctt cga aac act gga ccc tgg ggc ctc ctc agc caa tgg atg ccc Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro 565 570 575	1728
tgg att ctc ccc ttc tta gga cct cta gca gct ata ata ttg cta ctc Trp Ile Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile Ile Leu Leu Leu 580 585 590	1776
ctc ttt gga ccc tgt atc ttt aac ctc ctt gtt aac ttt gtc tct tcc Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser 595 600 605	1824

18

aga atc gaa gct gta aaa cta caa atg gag ccc aag atg cag tcc aag 1872
 Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys
 610 615 620

act aag atc tac cgc aga ccc ctg gac cgg cct gct agc cca cga tct 1920
 Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser
 625 630 635 640

gat gtt aat gac atc aaa ggc acc cct cct gag gaa atc tca gct gca 1968
 Asp Val Asn Asp Ile Lys Gly Thr Pro Pro Glu Glu Ile Ser Ala Ala
 645 650 655

caa cct cta cta cgc ccc aat tca gca gga agc agt tag agc ggt cgt 2016
 Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser Ser Gly Arg
 660 665 670

cgg cca acc tcc cca aca gca ctt agg ttt tcc tgt tga 2055
 Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys
 675 680 685

<210> 23

<211> 28

<212> PRT

<213> Homo sapiens

<400> 23

Pro Lys Thr Ala Asn Leu Val Ala Asp Ile Thr Ser Leu Ala Lys Tyr
 1 5 10 15

Gln Gln Val Leu Lys Thr Leu Gln Gly Thr Tyr Pro
 20 25

<210> 24

<211> 55

<212> PRT

<213> Homo sapiens

<400> 24

Glu Glu Gly Lys Glu Leu Phe His Pro Cys Asp Met Val Leu Val Lys
 1 5 10 15

Ser Leu Pro Ser Asn Ser Pro Ser Leu Asp Thr Ser Trp Glu Gly Pro
 20 25 30

Tyr Pro Val Ile Leu Ser Thr Pro Thr Ala Val Lys Val Ala Gly Val
 35 40 45

Glu Ser Trp Ile His His Thr
 50 55

<210> 25

<211> 38

<212> PRT

<213> Homo sapiens

19

<400> 25

Val Lys Ser Trp Ile Leu Pro Lys Glu Pro Glu Asn Pro Gly Asp Asn
 1 5 10 15

Ala Ser Tyr Ser Cys Glu Pro Leu Glu Asp Leu Arg Leu Leu Phe Lys
 20 25 30

Gln Gln Pro Gly Gly Lys
 35

<210> 26

<211> 540

<212> PRT

<213> Homo sapiens

<400> 26

Ile Pro Met Ala Leu Pro Tyr His Ile Phe Leu Phe Thr Val Leu Leu
 1 5 10 15

Pro Ser Phe Thr Leu Thr Ala Pro Pro Cys Arg Cys Met Thr Ser
 20 25 30

Ser Ser Pro Tyr Gln Glu Phe Leu Trp Arg Met Gln Arg Pro Gly Asn
 35 40 45

Ile Asp Ala Pro Ser Tyr Arg Ser Leu Ser Lys Gly Thr Pro Thr Phe
 50 55 60

Thr Ala His Thr His Met Pro Arg Asn Cys Tyr His Ser Ala Thr Leu
 65 70 75 80

Cys Met His Ala Asn Thr His Tyr Trp Thr Gly Lys Met Ile Asn Pro
 85 90 95

Ser Cys Pro Gly Gly Leu Gly Val Thr Val Cys Trp Thr Tyr Phe Thr
 100 105 110

Gln Thr Gly Met Ser Asp Gly Gly Gly Val Gln Asp Gln Ala Arg Glu
 115 120 125

Lys His Val Lys Glu Val Ile Ser Gln Leu Thr Arg Val His Gly Thr
 130 135 140

Ser Ser Pro Tyr Lys Gly Leu Asp Leu Ser Lys Leu His Glu Thr Leu
 145 150 155 160

Arg Thr His Thr Arg Leu Val Ser Leu Phe Asn Thr Thr Leu Thr Gly
 165 170 175

Leu His Glu Val Ser Ala Gln Asn Pro Thr Asn Cys Trp Ile Cys Leu
 180 185 190

Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp
 195 200 205

Asn Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro
 210 215 220

Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val
 225 230 235 240
 Lys Phe Ser Asn Thr Thr Tyr Thr Thr Asn Ser Gln Cys Ile Arg Trp
 245 250 255
 Val Thr Pro Pro Thr Gln Ile Val Cys Leu Pro Ser Gly Ile Phe Phe
 260 265 270
 Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Ser Glu Ser
 275 280 285
 Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu
 290 295 300
 Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val
 305 310 315 320
 Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly
 325 330 335
 Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu
 340 345 350
 Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val
 355 360 365
 Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Val Leu Gln Asn
 370 375 380
 Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu
 385 390 395 400
 Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val
 405 410 415
 Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu
 420 425 430
 Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro
 435 440 445
 Trp Ile Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile Ile Leu Leu Leu
 450 455 460
 Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser
 465 470 475 480
 Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys
 485 490 495
 Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser
 500 505 510
 Asp Val Asn Asp Ile Lys Gly Thr Pro Pro Glu Glu Ile Ser Ala Ala
 515 520 525

21

Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser
 530 535 540

<210> 27
 <211> 15
 <212> PRT
 <213> Homo sapiens

<400> 27
 Ser Gly Arg Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys
 1 5 10 15

<210> 28
 <211> 1080
 <212> ADN
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(1080)

<400> 28
 acc tct ttt gta gaa aag gca aat gga gtg aag tgc cat aag tac aaa 48
 Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
 1 5 10 15

ctt tct ttt cat taa gag aca act cac aat tat gta aaa agt gtg att 96
 Leu Ser Phe His Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
 20 25 30

tat gcc cta cag gaa gcc ttc aga gtc tac ctc cct atc cca gca tcc 144
 Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser
 35 40 45

ccg act cct tcc cca act aat aag gac ccc cct tca acc caa atg gtc 192
 Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val
 50 55 60

caa aag gag ata gac aaa agg gta aac agt gaa cca aag agt gcc aat 240
 Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn
 65 70 75 80

att ccc caa tta tga ccc ctc caa gca gtg gga gga aga gaa ttc ggc 288
 Ile Pro Gln Leu Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly
 85 90 95

cca gcc aga gtg cat gtg cct ttt tct ctc cca gac tta aag caa ata 336
 Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile
 100 105 110

aaa aca gac tta ggt aaa ttc tca gat aac cct gat ggc tat att gat 384
 Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp
 115 120 125

gtt tta caa ggg tta gga caa ttc ttt gat ctg aca tgg aga gat ata	432
Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile	
130 135 140	
atg tca ctg cta aat cag aca cta acc cca aat gag aga agt gcc acc	480
Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr	
145 150 155 160	
ata act gca gcc tga gag ttt ggc gat ctc tgg tat ctc agt cag gtc	528
Ile Thr Ala Ala Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val	
165 170 175	
aat gat agg atg aca aca gag gaa aga gaa tga ttc ccc aca ggc cag	576
Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Phe Pro Thr Gly Gln	
180 185 190	
cag gca gtt ccc agt cta gac cct cat tgg gac aca gaa tca gaa cat	624
Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu His	
195 200 205	
gga gat tgg tgc tgc aga cat ttg cta act tgt gtc cta gaa gga cta	672
Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly Leu	
210 215 220	
agg aaa act agg aag aag tct atg aat tac tca atg atg tcc acc ata	720
Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr Ile	
225 230 235 240	
aca cag gga agg gaa gaa aat cct act gcc ttt ctg gag aga cta agg	768
Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu Arg	
245 250 255	
gag gca ttg agg aag cgt gcc tct ctg tca cct gac tct tct gaa ggc	816
Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu Gly	
260 265 270	
caa cta atc tta aag cgt aag ttt atc act cag tca gct gca gac att	864
Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp Ile	
275 280 285	
aga aaa aaa ctt Caa aag tct gcc gta ggc cgg gag caa aac tta gaa	912
Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu Glu	
290 295 300	
acc cta ttg aac ttg gca acc tcg gtt ttt tat aat aga gat cag gag	960
Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln Glu	
305 310 315 320	
gag cag gcg gaa cag gac aaa cgg gat taa aaa aaa ggc cac cgc ttt	1008
Glu Gln Ala Glu Gln Asp Lys Arg Asp Lys Lys Lys Gly His Arg Phe	
325 330 335	
agt cat gac cct cag gca agt gga ctt tgg agg ctc tgg aaa agg gaa	1056
Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg Glu	
340 345 350	

23

aag ctg ggc aaa ttg aat gcc taa
 Lys Leu Gly Lys Leu Asn Ala
 355 360

1080

<210> 29
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 29
 Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
 1 5 10 15
 Leu Ser Phe His
 20

<210> 30
 <211> 63
 <212> PRT
 <213> Homo sapiens

<400> 30
 Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile Tyr Ala Leu Gln Glu
 1 5 10 15
 Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser Pro Thr Pro Ser Pro
 20 25 30
 Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val Gln Lys Glu Ile Asp
 35 40 45
 Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn Ile Pro Gln Leu
 50 55 60

<210> 31
 <211> 79
 <212> PRT
 <213> Homo sapiens

<400> 31
 Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly Pro Ala Arg Val His
 1 5 10 15
 Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile Lys Thr Asp Leu Gly
 20 25 30
 Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp Val Leu Gln Gly Leu
 35 40 45
 Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile Met Ser Leu Leu Asn
 50 55 60
 Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr Ile Thr Ala Ala
 65 70 75

<210> 32
 <211> 21
 <212> PRT
 <213> Homo sapiens

<400> 32
 Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val Asn Asp Arg Met Thr
 1 5 10 15

Thr Glu Glu Arg Glu
 20

<210> 33
 <211> 142
 <212> PRT
 <213> Homo sapiens

<400> 33
 Phe Pro Thr Gly Gln Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp
 1 5 10 15

Thr Glu Ser Glu His Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys
 20 25 30

Val Leu Glu Gly Leu Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser
 35 40 45

Met Met Ser Thr Ile Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe
 50 55 60

Leu Glu Arg Leu Arg Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro
 65 70 75 80

Asp Ser Ser Glu Gly Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln
 85 90 95

Ser Ala Ala Asp Ile Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro
 100 105 110

Glu Gln Asn Leu Glu Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr
 115 120 125

Asn Arg Asp Gln Glu Glu Gln Ala Glu Gln Asp Lys Arg Asp
 130 135 140

<210> 34
 <211> 29
 <212> PRT
 <213> Homo sapiens

<400> 34
 Lys Lys Gly His Arg Phe Ser His Asp Pro Gln Ala Ser Gly Leu Trp
 1 5 10 15

Arg Leu Trp Lys Arg Glu Lys Leu Gly Lys Leu Asn Ala
20 25

```
<210> 35
<211> 685
<212> PRT
<213> Homo sapiens
```

400> 35	Pro	Lys	Thr	Ala	Asn	Leu	Val	Ala	Asp	Ile	Thr	Ser	Leu	Ala	Lys	Tyr
1					5					10					15	
Gln	Gln	Val	Leu	Lys	Thr	Leu	Gln	Gly	Thr	Tyr	Pro	Xaa	Glu	Glu	Gly	
			20					25					30			
Lys	Glu	Leu	Phe	His	Pro	Cys	Asp	Met	Val	Leu	Val	Lys	Ser	Leu	Pro	
		35					40					45				
Ser	Asn	Ser	Pro	Ser	Leu	Asp	Thr	Ser	Trp	Glu	Gly	Pro	Tyr	Pro	Val	
		50				55					60					
Ile	Leu	Ser	Thr	Pro	Thr	Ala	Val	Lys	Val	Ala	Gly	Val	Glu	Ser	Trp	
65					70					75					80	
Ile	His	His	Thr	Xaa	Val	Lys	Ser	Trp	Ile	Leu	Pro	Lys	Glu	Pro	Glu	
				85					90					95		
Asn	Pro	Gly	Asp	Asn	Ala	Ser	Tyr	Ser	Cys	Glu	Pro	Leu	Glu	Asp	Leu	
			100					105					110			
Arg	Leu	Leu	Phe	Lys	Gln	Gln	Pro	Gly	Gly	Lys	Xaa	Leu	Lys	Ser	Xaa	
		115					120					125				
Ile	Pro	Met	Ala	Leu	Pro	Tyr	His	Ile	Phe	Leu	Phe	Thr	Val	Leu	Leu	
	130					135					140					
Pro	Ser	Phe	Thr	Leu	Thr	Ala	Pro	Pro	Pro	Cys	Arg	Cys	Met	Thr	Ser	
145					150					155					160	
Ser	Ser	Pro	Tyr	Gln	Phe	Leu	Trp	Arg	Met	Gln	Arg	Pro	Gly	Asn		
				165				170					175			
Ile	Asp	Ala	Pro	Ser	Tyr	Arg	Ser	Leu	Ser	Lys	Gly	Thr	Pro	Thr	Phe	
		180						185					190			
Thr	Ala	His	Thr	His	Met	Pro	Arg	Asn	Cys	Tyr	His	Ser	Ala	Thr	Leu	
		195					200					205				
Cys	Met	His	Ala	Asn	Thr	His	Tyr	Trp	Thr	Gly	Lys	Met	Ile	Asn	Pro	
	210					215					220					
Ser	Cys	Pro	Gly	Gly	Leu	Gly	Val	Thr	Val	Cys	Trp	Thr	Tyr	Phe	Thr	
225					230					235					240	
Gln	Thr	Gly	Met	Ser	Asp	Gly	Gly	Gly	Val	Gln	Asp	Gln	Ala	Arg	Glu	
			245						250					255		

Lys His Val Lys Glu Val Ile Ser Gln Leu Thr Arg Val His Gly Thr
 260 265 270
 Ser Ser Pro Tyr Lys Gly Leu Asp Leu Ser Lys Leu His Glu Thr Leu
 275 280 285
 Arg Thr His Thr Arg Leu Val Ser Leu Phe Asn Thr Thr Leu Thr Gly
 290 295 300
 Leu His Glu Val Ser Ala Gln Asn Pro Thr Asn Cys Trp Ile Cys Leu
 305 310 315 320
 Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp
 325 330 335
 Asn Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro
 340 345 350
 Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val
 355 360 365
 Lys Phe Ser Asn Thr Thr Tyr Thr Thr Asn Ser Gln Cys Ile Arg Trp
 370 375 380
 Val Thr Pro Pro Thr Gln Ile Val Cys Leu Pro Ser Gly Ile Phe Phe
 385 390 395 400
 Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Ser Glu Ser
 405 410 415
 Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu
 420 425 430
 Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val
 435 440 445
 Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly
 450 455 460
 Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu
 465 470 475 480
 Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val
 485 490 495
 Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Val Leu Gln Asn
 500 505 510
 Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu
 515 520 525
 Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val
 530 535 540
 Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu
 545 550 555 560

27

Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro
 565 570 575
 Trp Ile Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile Ile Leu Leu Leu
 580 585 590
 Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser
 595 600 605
 Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys
 610 615 620
 Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser
 625 630 635 640
 Asp Val Asn Asp Ile Lys Gly Thr Pro Pro Glu Glu Ile Ser Ala Ala
 645 650 655
 Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser Xaa Ser Gly Arg
 660 665 670
 Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys Xaa
 675 680 685

<210> 36
 <211> 360
 <212> PRT
 <213> Homo sapiens

<400> 36
 Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
 1 5 10 15
 Leu Ser Phe His Xaa Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
 20 25 30
 Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser
 35 40 45
 Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val
 50 55 60
 Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn
 65 70 75 80
 Ile Pro Gln Leu Xaa Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly
 85 90 95
 Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile
 100 105 110
 Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp
 115 120 125
 Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile
 130 135 140

28

Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr
 145 150 155 160

Ile Thr Ala Ala Xaa Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val
 165 170 175

Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Xaa Phe Pro Thr Gly Gln
 180 185 190

Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu His
 195 200 205

Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly Leu
 210 215 220

Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr Ile
 225 230 235 240

Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu Arg
 245 250 255

Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu Gly
 260 265 270

Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp Ile
 275 280 285

Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu Glu
 290 295 300

Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln Glu
 305 310 315 320

Glu Gln Ala Glu Gln Asp Lys Arg Asp Xaa Lys Lys Gly His Arg Phe
 325 330 335

Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg Glu
 340 345 350

Lys Leu Gly Lys Leu Asn Ala Xaa
 355 360

<210> 37
 <211> 26
 <212> ADN
 <213> Homo sapiens

<400> 37
 ggacataga ggacactcca ggacta

26

<210> 38
 <211> 25
 <212> ADN
 <213> Homo sapiens

<400> 38
cctcagtcct gctgctggat catct 25

<210> 39
<211> 27
<212> ADN
<213> Homo sapiens

<400> 39
cctccaagca gtgggaggaa gagaatt 27

<210> 40
<211> 28
<212> ADN
<213> Homo sapiens

<400> 40
ccttcctgt gttattgtgg acatcatt 28

<210> 41
<211> 30
<212> ADN
<213> Homo sapiens

<400> 41
ggaagaagtc tatgaattat tcaatgatgt 30

<210> 42
<211> 27
<212> ADN
<213> Homo sapiens

<400> 42
gggacacaga atcagaacat ggagatt 27

<210> 43
<211> 27
<212> ADN
<213> Homo sapiens

<400> 43
gccttcagaa gagtcagggtg acagaga 27

<210> 44
<211> 25
<212> ADN
<213> Homo sapiens

<400> 44
gagcctccaa agtccacttg cctga 25

<210> 45
<211> 29
<212> ADN
<213> Homo sapiens

<400> 45
gatttcagta tctactagtc tgggtagat 29

<210> 46
<211> 27
<212> ADN
<213> Homo sapiens

<400> 46
ctaggaaaac cagctagtc tgcctca 27

<210> 47
<211> 28
<212> ADN
<213> Homo sapiens

<400> 47
ccaagacagc caacttagtt gcagacat 28

<210> 48
<211> 28
<212> ADN
<213> Homo sapiens

<400> 48
ggacgctgca ttctccatag aaactctt 28

<210> 49
<211> 29
<212> ADN
<213> Homo sapiens

<400> 49
gcaatactac atacacaacc aactcccaa 29

<210> 50
<211> 26
<212> ADN
<213> Homo sapiens

<400> 50
gggggaggca tatccaacag ttagta 26

<210> 51
<211> 30
<212> ADN
<213> Homo sapiens

<400> 51
ccatctacac tgaacaagat ttatacactt

30

<210> 52
<211> 28
<212> ADN
<213> Homo sapiens

<400> 52
aatgccagta cctagtgcac cttagcact

28

<210> 53
<211> 31
<212> ADN
<213> Homo sapiens

<400> 53
cgaatacaac gtagagcaga ggagcttcga a

31

<210> 54
<211> 28
<212> ADN
<213> Homo sapiens

<400> 54
agcccaagat gcagtcgaag actaagat

28

<210> 55
<211> 27
<212> ADN
<213> Homo sapiens

<400> 55
gcgtagtaga ggttgtagcag ctgagat

27

<210> 56
<211> 27
<212> ADN
<213> Homo sapiens

<400> 56
cccttaccac gagtttctat ggagaat

27

<210> 57
<211> 27
<212> ADN
<213> Homo sapiens

<400> 57
accgctctaa ctgcttcctg ctgaatt

27

<210> 58
<211> 420
<212> PRT
<213> Homo sapiens

<400> 58
Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
1 5 10 15
Leu Ser Phe His Xaa Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
20 25 30
Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Leu Pro Ala
35 40 45
Ser Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met
50 55 60
Val Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala
65 70 75 80
Asn Ile Pro Gln Leu Xaa Pro Leu Gln Ala Val Gly Gly Arg Glu Phe
85 90 95
Gly Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln
100 105 110
Ile Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile
115 120 125
Asp Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp
130 135 140
Ile Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala
145 150 155 160
Thr Ile Thr Ala Ala Xaa Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln
165 170 175
Val Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Xaa Phe Pro Thr Gly
180 185 190
Gln Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu
195 200 205
His Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly
210 215 220
Leu Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr
225 230 235 240
Ile Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu
245 250 255

Arg Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu
 260 265 270

Gly Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp
 275 280 285

Ile Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu
 290 295 300

Glu Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln
 305 310 315 320

Glu Glu Gln Ala Glu Gln Asp Lys Arg Asp Xaa Lys Lys Gly His Arg
 325 330 335

Phe Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg
 340 345 350

Glu Lys Leu Gly Lys Leu Asn Ala Xaa Xaa Gly Leu Leu Pro Val Arg
 355 360 365

Ser Thr Arg Thr Leu Xaa Lys Arg Leu Ser Lys Xaa Lys Xaa Ala Ala
 370 375 380

Pro Ser Ser Met Pro Leu Ile Ser Arg Glu Ser Leu Glu Gly Pro Leu
 385 390 395 400

Pro Gln Gly Thr Lys Val Leu Xaa Val Arg Ser His Xaa Pro Asp Ser
 405 410 415

Ser Ser Arg Thr
 420

<210> 59
 <211> 32
 <212> ADN
 <213> Homo sapiens

<400> 59
 taaactacaa atggttcttc aaatggagcc ca 32

<210> 60
 <211> 32
 <212> ADN
 <213> Homo sapiens

<400> 60
 gatgcagtcc aagatgcagt ccatgactaa ga 32

<210> 61
 <211> 1740
 <212> ADN
 <213> Homo sapiens

<400> 61
 aggttggtg acaaccgctc ttaactgctt catgctgaat tggggcatag taggggtcgt 60
 gcagtttgaga ttctcttggg aggggtgcct tcaatgtcat caacatttga gcatgggcta 120
 gcaggccagt ccagggttcc gcggtagatc ttagtcatgg actgcatctg gggctccatt 180
 tgaagaacca ttgttagttt tacagcttcg attctggaag agacaaacgt aacaaggagg 240
 ttaaagatac aaggattgaa atgtacggcc tgaagtgcag ggcataatga gtgtggcgg 300
 tgcaagtggg gtttctctta gaaaaactcc gatataatag gccatcaata ttcttgaggaa 360
 gccacattct ccataagaac tctcggttaag gggagctact ggtagtacag cagcatacacg 420
 ggggtgcagt gagagtgaaa ggggtaaga gaacagtaaa aagaaaaata tgacaaggaa 480
 gggccaaagat gatctacgat tctagtact tctctcagg ttgtgcctg aagagcaggc 540
 gcagatctctc tagaggttca caggaaatag tagcattgtc tgcctggaatt tcgggttctc 600
 ttggcagtat ccagggtttg gctcgagtgt gacttatcca agactccaat ccagccaatt 660
 aactcgcggtt aggttagata aaatgactgg gtagggtctt tcccaggatg tgtgtaggga 720
 tggggaatta aaggggaaag gacttgacta ataccatgtc accagggttg aataattcct 780
 ttccctctctc tcagggcacg gttccctgta atgttttaag aactcgttga tatttggtta 840
 aggaggtgat gttctgcaact aagtggcgg tctctcagtc aagcacaagg tcatgtgta 900
 ggaagggtct tccatacagc atctcatatg gactaagtc accaggttgg ggcacagttc 960
 ggtattcttag taaggctata ggcaacagag caggccatgc aaggtgggtt ttgtgggtta 1020
 gcttttttag atgtcgtttg agtgtttcat tcaatttctc aacttttctc gaggatcgtg 1080
 gcctccaggc acagtgttag tgatattgta taccataacg ctgggatact ccctgcgtta 1140
 gctcagcctt gaaattgggg ccattgtcac tctgtaaaac tcagggaagt ccgaattctg 1200
 gaattatttc atgaattagt acttttatta cctcttgggc cttttctgtc tacaaggga 1260
 aggcctccac ccacaacgat aagtatacca gatttagata tactgaaatt ctctgagatt 1320
 gggcatgggt gtaaaaacta gttgctagtc ttctcctggg taatggcctg tctctgttct 1380
 tcttagaaga gcttggccat aaggcagggg attatttctt tggcacactc cacaggccct 1440
 gactatctgc ttgacagttt tgaaaaggcc ttgtccagta aataatgatt tggccatctg 1500
 atgggtgctg tcaatgccta agtgaagggt ctggtgaagg gttttaagta atttccattg 1560
 gttagctgca ggcaaaagta ttttttctt ggtggtctgg catctcagg agagaaacct 1620
 atgtcctgt gagtttctcc atttccattc ttctgctgag tactggagct tggtttccca 1680
 gaggggatta ccccaacta ggggtccttc tgtaagcatt tctaaggag agtctcgtc 1740

<210> 62
 <211> 7140
 <212> ADN
 <213> Homo sapiens

<400> 62
 ttggtcttaa gaacacaaat gatatggctc caatgactgg aggaacacca gggctcttgg 60
 tctcagctgt atttagataa aacgactgtc aggcctctga gcccaagcta agccatctct 120
 cctgtgacc tgcacgtata catccagatg gctggaagta accaaagaat cacaagaaga 180
 gtgaaatgg cctgttctgt ccttaactga tgacattcca ccatgtgatt ttgttctctg 240
 cccatcttaa ctgagcgatt aaacttgtga aattctctct ctgggtctca aactccccc 300
 actgagcacc ttgtgacccc cgccctctgc cctaagagaa aaccccttt gattataatt 360
 tccactacc caccocaaat ctataaaatg gccccaaccc tatctccttt cgtcgtactcc 420
 ttcttctgac tcagcccgcc tgcacccagg tgaataaac agccttgttg ctcacacaaa 480
 gctctgttgg tggactctct tcacacggac gctcatgaca tttggtgcca aaactctgga 540
 taggaggact ccttcaggag accagtcccc tgccttggcc ctccactctg gaggacatcc 600
 acctacaacc ttgggtctctc agaccaaca gcccaaggaa cagctcacca atttcaaatc 660
 aggtaaagcag ttctttcaet ctcttctcca cctctctctg ctacccttta actccctct 720
 ctcaactacc ttcaactctc ctgtctcttc aatctcagtt ctcttttcat tctagttagat 780
 acaaaaggaa cacattttat ccattggacc cggggacgccc tgcttgatta ttacaccaca 840
 agacagctct cctctgtgtg ttaactcact ggtggggaca cctgctcttg tcatctcaac acattccctt 900
 ctccatttgg tctctgacac ggtgacgtac gctgcttgg gctgctcacc caccctctct 960
 ggtgtgtacgt caactgcata agcaggggac gctgcttgg gctgctcacc caccctctct 1020
 tctgtgtctc taatttcttc tttaaactta cctctctcac tatgggcata ctctcgtcct 1080
 ccattcccc tcttctctcc tttagcctgt tcttataaaa cctaaaaact ctccaactca 1140

caccctgacct aaaacctaata tgccttattt tcttctgcac cactgcgtgg ctgcagtaca 1200
 aaacttgataa tagcttttaa tggccagaar atggcaacttt caatttctcc atcctacaag 1260
 atctagataaa tttttgtgaa aaaaatgaaa aatggctctga gatgcctgac gtccaggcat 1320
 tctttttacac attgtgtccct ccttagtctct tgcctcccaat gcgactcact ccaaaacttt 1380
 ctctctttctc tctctgtctgt tctctcagtc tccaccccaa gcctctgagt ctttgaatcc 1440
 tctctttgcta cagaccatct tgaactctcc cctctctccc agggctgctcc tccacaggcc 1500
 gagccaggtc ccaatttctc ctacgctctc gctcccccac cctataatcc ttttatcacc 1560
 tctctctctc acactctagc cggcttacag tttctgtctg tgactagccc tcccctactct 1620
 gcccaacaat tctctcttaa agaggtggct ggagctaaag gcatgctcaa ggttaatgct 1680
 ccttttttctt tatctgacct ctcccacaat agttagcggt taogctcttt tctcatcaat 1740
 ataaaaaccc agccagctca tggcccatct gccacaaccc cttacaggct tccagccctc 1800
 agaccctgaa gggctcagaag gccgtcttat tctcaatatg cattttatta ttaacggcct 1860
 tcccaacatt aaataaagct ccaaaaatta aattctggcc ctcaaacccc acaacaggac 1920
 ttaattaaac tcaacttcaa gtgtacaaga atagagtaga ggacagcaag tccagcaaac 1980
 tttgagttgc aatctcttgc actgacgtgc cagcgctgac caggcggttc ctccaggacc acctcccaca 2100
 aagaacttca aaacacctga actgagctgag caattgggcca aggaatgcct gcagcccaag 2160
 ggatcttctg tcaactgtcc agcaagctcc attttgtgca ggaacctcga ctccagcctc 2220
 caccggcgag ccaactccag agccctcgga actctggccc aaggctctct gactgactcc 2280
 ttcccgagat tcttcgggct agcagctgaa gactgacact gcccgactac ttcagaagtc 2340
 cctctggataa tcaaggatac tgagcttcag gtaactctca cagtggaggc taagtccatc 2400
 cccctgtttta tgcatacagg ggctacccac tccactatcc ctctctttta agggcctgtt 2460
 tcccttttccc ccataactgt tgtgggtatt gacgggcaag ctctcaaaacc cttctaaaaa 2520
 ccccactctt gggtccaaact tggacaacat tcttttatgc actctttttc agttatctct 2580
 acctgccccg ttcctttatt agggcgagac atttttaacca aattatctgc ttcccagact 2640
 attcttgggc tacagctcata tctccttgcc gccctctctc ccaaccccaa gctcctctca 2700
 tatctttccc tcatatcccc ccaccttaac ccacaagtat gggacacctc tactcccccc 2760
 ctggcaaccc atcacagccc cattactatc ccattaaaac ctaatcaccc ttacctctcc 2820
 caatgcagat atccccatcc acaacaggct ttaaagggat tgaaggctgt tatcacttgc 2880
 ctgctacagc acgggcttct aaaaactata aactctcoat acaattcccc cattttactc 2940
 gtctaaaaac cagataagtc ttaacggtta gttcagaatc tgcaccttat caaccaaatt 3000
 gtttttgcta tccaccctgt agcacccaac tctgaactc tttgtctctc aatgctctcc 3060
 ccacaaactc actattccgt tcttgatctt aaagatgctt ttttctactat tccctctgac 3120
 cccctactccc agcctctctt tgcctttacc tggactgacc ctgacaccca tgaactccag 3180
 cagcttaact gggctgtact gcccgaaagg ttcagggaca gccctcatta ctccagccaa 3240
 gctctttctc atgatttact tcttttccac ctctctgctt ctacacttat tcaatatatt 3300
 gatgacactc tacttttgat cccctctctt aaattctctc aacaagacac actcctgtct 3360
 cttcaacatt tgttctccaa aggatctcgg gtatccccct ccaaaagctca cttctctctc 3420
 ccactctgta cataactcgg cataattctt catgaaaaaa catgtgctct cctctgccat 3480
 tgcgtctcca actgatctct caaatcccaa cctctctcac aaaaacacaa cctcttcccc 3540
 tcttaggcat ggttgataac ttttgccttt ggataactcg ttttgccatc ctacaacaa 3600
 cattatataa actcacaaaa ggaacactag ctgacccact agattctaaa tcttctcccc 3660
 actcctcttt ccattctctg aagacagact tagagactgc tcccaacta gctctccctg 3720
 tctcatccca acccttttca ttacacacag ccgaagtcca gggctgtgca gtcggtaact 3780
 ttacacaagg accggaacca tgcctgtgat cctttttgtc caaaccaact gacctaattc 3840
 ttttagctct cctcatgact tctcctgagg tagcttccgc tgcctcataa tcttttagag 3900
 cccctcaaat cacaacctat gctcaactac ctctctacac ctctctacac ctttcaaatc 3960
 tattttcttt ctacacactg acgcatatac tttctgtccc ccggctctct aactgttat 4020
 cactctttgt tgagtctccc acaattacaa tcttctctgg occagacttc agctgtgctc 4080
 cccactattt tctggataac acactgaacc ctgatgatt tatgtctctg atctactctga 4140
 cattcacccc atttccccat atttctctgt tttctgtttc tcatgttgat cacatttgg 4200
 ttactgaggg cagtctccac aggcctgact gccactcaac agcaaaaggca ggcctatctc 4260
 tagaattctc cacatccatc attgaggcta ctgctctgcc cccctccact acctctcagc 4320
 aagccgaact gattgcttta actcgggctc tcaactcttg aaagggacta cactgcaata 4380
 tttataacta cctttccata gccctccata cctatgctgt taactgtctt ataaaactc 4440
 aaagaggttt cctcactacg caagggtctc catcatctaa tgcctcttta ataaaaact 4500
 tctcaagcg tgttttactt ccaagggaag ctggagtcac acactgcacg gccaaccaa 4560
 aggcgtcaga tcccatctact ctaggaaatg ctatgtctga taaggtagct aaagaagcac 4620

cttagcgttcc aacttctgtc cctcatggcc agtttttttc cttcccatca gtcattccca 4680
 cctactcccc cattgaaact tccgcctatc aatctcttct cacacaaggc aaatgggtct 4740
 tagaccgaag aaaaatcttc cttccagcct cacaggccca ttctattctg tctatcttcc 4800
 ataaccctctt ccatgttaggt tacaagccac tagtccacct cttagaacct ctcatttctc 4860
 tccatcgttg aacatatacc tcaaggaat cactctctag tgttccactc gctattctac 4920
 taccctccag ggaattgtca gggccctctc cctccctaca catcaagctc ggggatttgc 4980
 cctggccag gactggcaaa ttgactttac tcaatggccc tgagtcaagg aactaaaaaa 5040
 caactcttg tgggtagaca ctgtcactgg atgggttagag gcccttccca cagggtctga 5100
 ggaaggcact cgaagtcttt cttcccttct gtacacata attccttggg ttgcctctcc 5160
 cactcttata cagtccaata acggagcagc ctttattagt caaatcactt gaggcagttt 5220
 tcaggctctt ggtattcagt ggaaccttcg tacccttacc tgrctcaat cttcaggaaa 5280
 ggtagaatgg actaatggtc ttttaaaaa acacccccc aaactcagcc tccaaactaa 5340
 aaaggaggat agagcccaaa aactcgcaac caagctagta attatgtctg acccccttgg 5400
 gcaactctta attggagtc ttaggctctc cgaatcttta gtcccttaat atctgttttt 5460
 ctcttctct tattcggacc ttgtgtcttc cgtttagttt ttcaattcat acaaaaccgc 5520
 atccaggcca tcaaccaatc ttctatacaa taaatgtctc taatctctcc cactctaggt tcccatgcc 5580
 cgccctttac cacaaaatct tccctcagct aacatagccc attatctctc cataccacc 5640
 cccataatcc cctctgaagc agccctgaga aactttcac actattttac attatttttc ttattaaat 5700
 ccaaaaattt tctgtcccca cctctgagcc caagccctga tatccctctg gacctgcaca 5760
 aagaagacag caatgtcagg ctctgagcc agtaactgaa gaatcacaaa agaagtgaat ttgcctgtt 5820
 tatcatctca cgaatgacat tccaccactg tgatttggtc ctgcccacc ttaactgagc 5880
 cctgccttaa cctgaatccc ttctcctggc tcaaaaacct ccccactgag cactctgtga 5940
 aaaaatttcc tccactacc acccaaatcc tataaaattg ccccactgag cctctgtgtc 6000
 ctgactcttt ttttggactc agcccgcctg accccaggtg aaataaacag ccttgttctg 6060
 cacacaaagc cgttctgttg gaactctctc acaggagcgg ggggtgacaac aacacggaca 6120
 cacatggagt ggttttaagg agcagagagt ttaatcacga aaaaagaagg aagaggctcc 6180
 cctgtacaga cagagaggga gggggctcca agccgagaga atgtgcagtg atgtgcagtg 6240
 gaaaatgggt tgattatact gggaggctgg agggaggggt gtctgatttg cacagggcc 6300
 aggggattgg gttgaccagg tgtatcattc atgtaccccg caaaaaacct atgtgcagtg 6360
 cctcagccct ttaatatgca aatgtgggtt gccatgatgt tctgaaaaa catgaattat 6420
 ctggaggggg ccatgacaact tggtagatgt gctgacaaga agagggtggg aatgcctatg 6480
 gtggccatgt tgggtggaac tagtttttaa tagcctgcat ttgcataca aagtttgtctg 6540
 gcttggctct ttaagctgtc ttittctgta gaaaaggaa ggtttggaat ggggtggagt 6600
 tgcttcttat tacaagaaaa ttccaaaaa cctttactct ttctagcttc caaaaaacta 6660
 ttcttaata acctatgtat taccataatt aggcagacc aaagatcctc gcaagtccaga 6720
 ccactgcaat taactgtctg gctttactgc tgattatggt agctgcattc accatgcctc 6780
 tcatatttga actgcctgac ctctgccacc ccacgacca cttatcccca cttataata 6840
 gccatttgc attgtaacct ctgccacta ttcccagct tgtggatat cctatagagt 6900
 aattcattca acatccattc caacacacc tctctgctt tctatactc tttagagagt 6960
 gaattactga gtccatgat cttcactgca gtcatttctg gctatgtgac atagttctg 7020
 acagtgaaca tagacagaag tccctggggc gggcttctct tctgggatga gggcaaacg 7080
 7140

<210> 63

<211> 44100

<212> ADN

<213> Homo sapiens

<400> 63

tgcctttatt tccgttaggt ggtcatatgg cgctagcact cacataaagc tacaggagg 60
 agcaaatgaa accaaaatca ctttaacctc acagacagag gccgtcgctcc cttctgatat 120
 ttggcccgctg tgtcgcatatc cgcctctctg acgtgggtat caaataaaact ccttagctcc 180
 cgcgcgctcg agccactctt gcctactttg atcctcgagc ggaggacaac atccgcctca 240
 ctgagctccc ttttatccaa taagagagcg ggaatgagta aggagtgcca ggaatggctg 300
 gagaatcgac agcgtcgccg atcgttttct cgtgcggaag atttgatga cgaagtgcgc 360
 ccccgagcg gctcggcgga gaggcgctgt gggtagaca agctttctctg tcccaccac 420
 tacaggctta cggcaggatg cgcagcgggg agagggggcg gggccgcag gggcggggcc 480

gatcgatctc ctcgcgctcc gacgtcctcg gccctgccggg tcccggggtcc ttgctggcgc 540
 taggggtgggc gaaccacagag cgacgtctccg ggacgatgtg gggcagcgat cgcctggcgg 600
 gtgctggggg aggcggggcg gcagtgactg tggccttcac caacgctcgc gaactgcttc 660
 tccactcgcg cggcgctctc gtgcccacgc tgcactcgtc gcaggttaac tgcggggccc 720
 gagccactcg atcttcagcc tgggttcgga cgaggccgaa gctctccagg gacggggcgg 780
 gacaccggct gccaccgggg cgcgcgcgaa gogogcagag atcagggtcc ctcgacggca 840
 gggccctctc gggtagcttc tggatcccac aagttccagg cagccctggg cctgctctta 900
 cccagggtctt ttcacttggt gaaactgaac ctgaaacgt taccactgtt 960
 tttataataa ttcccttatt caggcttgaa aagctctcga gaagtgggtt gttttatata 1020
 tttataaagg tgttttccct gccagccoat tccagttaac ctgcgctcgt gccctccggg 1080
 ccggagagag gggcagcaga gttgttggcg gagccctcgt cgggtcccgg ggaactaaga 1140
 ccgctcccca tgagcgggaa aggttaatac aatgatgtt ctgcctcgcg tgcgtgacgc 1200
 ggaacacagc tgtagtgtgt taggaacaca taacgtagtt aagatcaact gaagctcgcg 1260
 gatcagtcgc ccttctggac gttgtgggta ggatgtttca cagttctaac cactgggtga 1320
 gatacagcgt ccatattttc ataattaaaa atagaggcac atggtctcac gagtgtgagt 1380
 gtacttatgg gggcaaaagg acggcgtaatt gaaatcttc ataaatccct gatcatggt 1440
 acccaccagt ggctaatacta tgcaatgaat agagtttga ataatttcaa gatcccttc 1500
 tttccacttg ggttaacttc ccatacctgc tttgtgtcca ctgaaaaact 1560
 gagtctcaga gaactcctct atcatcgtcg ttattatttt ttaccactaa gtacacaact 1620
 ttttggtttt tgatgggtct tatggctaga gacaaatcag tcaactgcac caagtccagc 1680
 gtagaagttg gttcagtgct ctgtcagctt cgatgggatt ttccaacgat ttccaactc 1740
 tgcacttaat agtaggaatg ctttcttaca gtaactctaa ttgactcca agatgagtt 1800
 gtaccttac attcactcat gtttaagaat ttagtgtct tgaactttgt tttaatttt 1860
 gaccccttcg gaagtactta taagaattaa ttcactcata tcttttgaa atgtaaagt 1920
 ttttagccct ggaacaaatt gctgtttctg ttcagcccat atttagcaga taggtcaact 1980
 ttactttcta attatacagt taataagttt attccttat agattccata aatctatca 2040
 ttttctccc gatgaattat ataaatttat agaatttat ttatatagaa aatttggaaa 2100
 gcatggaaaa tttataacaa gaaaataagt taccataaas cccagaacat agaggtgact 2160
 aatgttgaca gtttggtaca aatcttccag ttttggttct aatctttatt tttaacata 2220
 atgaggtcct gtatacacac gtacagtttt gtgtcctggt gtttttattt aatgttata 2280
 tgagtgcttt attttgttaa aaggtcatca ttttaagttg ttaatttagta ttctagaca 2340
 aatttgccat aatttattta attgtttact atgattgacc atttagattg tactaattt 2400
 ttaggcata gaagtgataa actatatttt aatcagacgt tgaataatac acatctttgt 2460
 ttagaaaaaa actattttatt tctgtgtgtc taggatagat tccagaatt ctgtgggtgt 2520
 aggccataga taattatgaa agcagaaaga ttcacaagtt gggagttaat acttgaatta 2580
 ctttatttgg ggtgaagcat tgagtgcaata atacagata tgcagtaata ggaagagggg 2640
 ttggaacaaat ggttttctcg cctatgtcag acttaactcg aagcttttaa gaatacagc 2700
 gttctgtaca accctcagac ctattaaatc agaactaaaa tttagggaa taggctttag 2760
 ccatctctaa ttttaaaaaa tttattcagg ctacttggaat gcaaaaaaga gttgagacct 2820
 actgtctcag aatcatagaa ttttaatgac gatagagacc taaagctctt aggtcgtttc 2880
 tgtactttta catgtaagga aactggcat cctaggccag taacattgcc atcgactcaa 2940
 ttgcccctct tgcctatagc tcaactctga tcaaccaaac taccgtttct actgtttctt 3000
 ctataaccaa tctccttccc acttctgttc ttttactcat gccattcttc cctcagctac 3060
 ttttctctc tccatacaaa ttccatgtct ttaaaaagga ataactctac cttctccaca 3120
 tagctttcca actctctgtt gccacatttt gtctcccctt caatactctc ctgttgtgtt 3180
 atgtgacaca tcaactttga tatactctgt actgtgtttc aagtatgtta ttcttttgtt 3240
 tactgaagtc attatttcag gactgaactac coagtagatg ctttaagtca gttatttcca 3300
 accctggcac tgttgacatt ttgagctgga taattttttg ttttgggggc tctctgtcat 3360
 attttaagat gtttaacagc acccttggcc tctatccagt agcgcgtctc actgctccc 3420
 cctattctgt acaaccaaaa aggtcttcag acattgtcag atgtctactg aagacaaaa 3480
 tcaactctgt ttgagacca ccgcttcaac taagtatact tctctgtact cagaaattga 3540
 tgtgatttga gcagggggag aggtatcata tacacagtag atgcaaaaga acctaatca 3600
 cactccgat attgcccac aattttcatt tcccttgrgt tagcaagaga taccactagg 3660
 ttgggacctg attattccta aggcattctg atgtatggtt ttactcgcag atttctgtgt 3720
 aatactgata cctcagtttg ggtcaaaaga ggtcaattaa ttgattgatt tgattagct 3780
 cctggaaaag acgctccttt ctagctgtct cttctctctc tttaactgaa tgcagcaggc 3840
 tctgtgttgc aagtgaatta tttgacata aaaaattaac tagaacattg gttcgcagag 3900
 tttgtcfaat ataactgagc acatattgtg gctttatgga gctggttact actttttgac 3960

caaataaaata attagaagta tttttcctcc tcaataagggt tcatTTTTTC ttttttcagt 4620
 gagctggtag agtttccctt tttgatattt cagggcacat tcatatttc catctcttaa 4090
 gttttccctc a:gaagtaga atttatctgg attatgtatt gctgactctg atgaaaacc 4110
 atagaaaagc tctggggcct gatcaccttc attcttgtaa tagctcacac ggttacagct 4200
 gatattgtaa cttaagactt ttgatcccaa ctctaggcaa aatcacactca atgaaaagaa 4260
 tttgtcagcc agaaacagttg gactgttctg tgaaaattgt gagaaaaaat ctgacacata 4320
 gtgatcactg atgatggctt tcttaaatat aaattgttaa taacatggctt aattttcagt 4380
 acgttatatt gtcccagaag tggctccaac attgtttgaa attgtctcca ttttaagaaa 4440
 ctaaagctgg ctatggtggc tcaagcctgt aatcccagca ctttggggagg ctgaggcagg 4500
 cagatcactt gaggctcagg gtctgagacc agcctggcca acatggtaaa accctactct 4560
 tactaaaaat accaaaaatta gccgggcatt tgggtggggcg ctgtaatccc agctacttgy 4620
 gaggctcagg caggagaaatt gcttgaatct gggagggtga ggttgcagtg agccgagatt 4680
 gtgccactgc cctccagcct ggggtacaga gtgagctccc gctccaagaa aaaaaaaata 4740
 aaaaagcaag aacataaaga ctgggcatgt tggctcatgc ctgtaatccc agcactttga 4800
 gagactgagg tgggaagatc acttgagccc aggaggttaa ggctgcagtg agccgtgat 4860
 gtgccactgt actcgagcct gggcaacaca gtgagatcct gtctcaggaa aaaaaaat 4920
 ccatgtaaat gaatgaattt gatatttaatt attttaatt atgaaaaact tttctgtagat 4980
 atgtagactt tgcactgttg cccaggctgg ctttgaact ctgggctcaa caactctccc 5040
 tgtctcagtc tcccaaaagta taaagattac acatgtgagc cactgcacct ggcctataat 5100
 ttttaacctt a:gaattttat ttgatataa ataaattaat aacactgaag ctctctgata 5160
 taataagctc ttttctgtgt gtgacggggt ctcaactctgt tgcacagact ggaggtgtaa 5220
 ggcactatca tggctcactg tagcctcaac ctccctcact caagtgcatt tcccactctg 5280
 gcttctcag tagatgggac cacaggcgta tgcaccacca cctggctgat ttttaaaat 5340
 tattattgat acatatgtaaa aaaaattatt ttaattttaa atgtatataa gtggctgggc 5400
 atggtgtgct atgctgttaa tcccgacagt tggggagccc gagggtggag gatcacttga 5460
 gaccaggagc ttaagccag cctaagcaac atagtgaat acagtgcact atgtatctta tagaaaaaaa 5520
 aaatggctag gtgtgtgtgt gtatgcctat attccagct actcaggaga ctgaggtgag 5580
 aggatgtcta gagccacaga gtttcaagtt acagtgcact atgattttgc cagtgactc 5640
 cagcctggac aacagagcaa aatcctgtct caaaaaaaa aaagtctga aaatgcttat 5700
 gatgcaatt aagttagtga aaggatatt aaattgtgcc tatatgaaca caactatgt 5760
 aaaaaacttg acatagagaa aaggattaac aagaatatga ccaaatgtt cacatggtt 5820
 tctgtttgtt ggagagaata tcagtagttc attgttttcc tccaagtgtt atatgttttc 5880
 cggagctctc ataagagatt tgtaattgtt taatcataga aaacctttt tttgtcttt 5940
 gcccaaaact tcactgtttt aatgaattgt cttttttaa tagaataaat gttattttt 6000
 gcttttttaa aacctatatt cccatagtta tatgagccct tacaattatt aagaggtctc 6060
 ataataaac gtttctgaa gggtaacaga gaacagcag taatcacctc tgagaacaga 6120
 gacatggctt cacattttac ccttttgtac gttttgtgt tttgccacat tgatattata 6180
 tcttccaat aaataagtaa ataaatatgg attgtatact ccatctggtt ggtgtttcat 6240
 aattctaaaa ttatatgtct acatttttaa agatgatatt tgtttctact tattaagaca 6300
 tatgttaaaa tagtaaattt atatcttatt taataatttc cctatttgata gacattttaag 6360
 acagttccaa gtgttccacta tcatagaaaa tactgcacag atgctttttg ctatagtttt 6420
 ttttttttct gaatcgttaa ttgggaataa atgctcaaat agttatatgt ggctcaactg 6480
 ctatttaagt ttattgtact actgctgcca ttttgaatt tgaagggttt gattaaattt 6540
 ataactgtct cattaagaata taagggtatt ggcttcatat gcatccacca gaatggggt 6600
 tgggaatga ttatagattt ttaaatgcta caacaaatgt agataacaga gaactattcta 6660
 tagaaactct tttggacatt tgaattgtaa taatgtatta ttttcatgt agatccagaaa 6720
 aatgtatacg aaaaactttt ttccctcat ttcttatat atagataca agctatacaga 6780
 gtggtctgga gtcacacgcc tgcatttctg agctgggtgg aaggcaggca ttttagtgat 6840
 gggggacagg taagcacatg tgatggcaat aactttcttc taatatcaca ttaatagaca 6900
 atagaaaata aattaaaaag tttagttttt tgttaaaaga ggtgagatgt cacctaattt 6960
 gtatgctatt atgtacactg tctaggatat tgaagctgac taactctgt ttttagtgca 7020
 tttctctgta gtttaccata ctccctactt gcttcttatt ctactattta actaatttt 7080
 cacatcccc actttttggt tcatgaaatt atttttctct agtgaattact aggtctact 7140
 tactattatt aaactttatt tctgacatat ttataaacct tccatggctc cacttgatta 7200
 aaaaataaaa attcagctgg gtgcggtggc tcacacctat aatcccagca ctttgggag 7260
 ccaaggtggg cggataaatt gaggtcagga ttgtgagacc agcctgcccc acgtgtgaa 7320
 acccccccct tctactaaaa attcaaaat tagctgggca tgggtggcag tgcctgtaa 7380
 cccagctact caggaggctg aggcaggaga attgtctgaa cctgggagggt ggaaggtgca 7440

gtgagctgag attgcaactgc tgcacttcaag ctgggtgaca agagcgaaac aatgtcttga 7500
 aaaaaataaa aaaaataaaaa attctacaac acagggttat tatatttcca tttttgtttt 7560
 cccttatgag tttaatatgt ttagattata aacctgaaag cttgaatacc tatgtctatt 7620
 tttttgtttc ttatgtttat caagtatttc ctttaaacat ttcttaaacat gtaagaataaa 7680
 tgtgaggctg ggcctcaatgg cttatgcctg taatccaggt gctttgggag gccaaaggtgg 7740
 gaggagccact tgaggccacg agttcaagat tagccctggct aggcacacata gcaagaggtt 7800
 attctctata aaaaattaaa aaatttagct gggcatggtt gcaaatgctt gatgtcccgat 7860
 ctactcagca gactgaggtta ggaggaatgc ttgagaccag gaattttagt tgaattctgat 7920
 ttgacatcc agcccgggca atagcaagac ttgaaagtaa aaaaatgagt ttaccccttt 7980
 taatacatat tctattatac tatittacca gtgagacctt aggettggaa gaetgagatt 8040
 cccagctccc tctcagaat ggggatctca aaatatttca gatacccttc catgtattac 8100
 attcatattt totgcaatrra gtctctctct tctctctctc ctctgtgtgc gtcttcattga 8160
 aaacaagtgt cattttaacat gtctctctct agaatcacgt ataggaacagc 8220
 tctctgtttg cagccctgoc agtaagacac tatctcctga gaaatcacgt ataggaacagc 8280
 aaagtggact ggctaggcca ggagtctcta gcttcttagg gggcaggaggc tgcttgtgct 8340
 ttcttcagaa ccagatatat atgtggactg aaacatttaa aacacagata gccaaaggtg 8400
 ctatacgttt aaaaacttata tagatggggc tacatttgct tctattacta ttctccctgt 8460
 acaatacaga agagtgcctat gcttttttaa gcaacagacta atcttcttta 8520
 tgcatttttt ttgatgagaa taggctactc atgagaaacta acactgactcc 8580
 cctgtacact cttaatgtgt gctagaatct taaaatttta gccacagagc gaccttagaa 8640
 atcatttaact ttgtgtcttt gtctcaaat acaaggagat ggaattattt cccaggattt 8700
 gcttagcagg ttacagtctc gccctctgag taccagcact tccctctggg acaacatcaa 8760
 ctctctgatt ttcaagctct aattagtaact ctgaagaact ctaactgttt ttaactccca 8820
 ttgtctttga agtgaacttta cctgattttt ttatgtctct tattgcagca atgccaactaa 8880
 gaaactcagt ccttagcttc ttgtgtggga ggaactcgtt tgtgtctgtc cagaactcat 8940
 ctctttcagta agggagatat tgaagagaaa tctactgagg agtctggggg tagggcaactc 9000
 agggaaattc tgcctccagt cacaaaagca gagaggagg gtgtgttacc tagagtattt 9060
 aacatgcaga ggcctttggat ttactcctt taatccttgg aaatgcttat ggaaggggaa 9120
 aggaagttaag atgtgtactc cagcttatag acatactagt gttacatata ttaactactt 9180
 aataggagggt tattattagt ttactttaac ttcaactgtt gaaggattat acttctcaat 9240
 atttgtctoc agtgtctatt tcaagtgtatt ttctactttt ctggaagcag catgtctgtt 9300
 gcaaaactc tagaataaat gagaataatt atatataga tcaagccata acttgatgat 9360
 atagtcatth tctcttatat tttttactta catttttaca ttttaagtat tactttcaat 9420
 ttgtaaaaac atgtctatgt gagatgtatt ttcttctatt ctgttaattag ttatgaaaaa 9480
 gtttttccaa aaatgctgag tatatacaagt ctgtgcttaag aataagtaat aaatatttgc 9540
 cacatgaata acatcacata tagccaaggtg cagtgtgttg cacctgtttt cccagctacc 9600
 caggaggtct aggcaggagg attgcttgag ccagggtttt ccaggctgca gtgaactatg 9660
 attgtaccac tctactccag aatgggtgac agagccagg cccatctctc aaaaacagaa 9720
 agaaagatta catagactac atatacaccc ccatccaaa catcacaca catctactta 9780
 acctaaaatg gtaagaaagt aactcttat ttcttaatat atgacacaga aaagtctttt 9840
 taaagttagtt taaaattttt aattttttct aggtattttc caagccatgt tcccatgtgt 9900
 tatctgttca acaagttgag gtggaacccc tctcagcaga tgattgggag atactggtaa 9960
 agaaaaacca ataaagaacta ataaagaacta tatataattc gagtttgttt tgaattataa gaatgaattt 10020
 tagctttctc taagctttat tgccatagct ggcctatagt ccagcacttt ttggaggcca gaagaggttg 10080
 gggcgaggca cagtagctca caagaccagg ctgggcaaca tgggtgaacc ccgtatctac 10140
 attgcttgag tccaggagtt aggcattgga gtgcattgca ttagtccagc toaggaattc 10200
 ggctgagcca ggagaaatgc ttgagccctg aagatcaagg ctgcagtagt tccaaataaa aaagagattc 10260
 gcattgtgac tccagtctgg caaactgaca actatagtta ataaatttgt attgggagt 10320
 attgatagag atctaatgta taactactct taccacaaaa acacaaaagt gggtaactgt 10380
 catgttaaat gagtagattt ttacttcaat atagtaacca ttatactatc tatatgtagc 10440
 gagatgatgt atatgttaat tattaaatat ggaacaaaat taaagtgaat tgactttttc 10500
 tcaatacacc atgtcgtgta gatattggag tcccttgaa acactcttct agatcaattt 10560
 attgagattt ttttttaact gcatgtctgt gtttgggtt atcaacaaac gtacattatt 10620
 gctgtgtgtt tctaggagct catttttctc ttgttaattt tctactata tagcatttag 10680
 cgaattagtt ttccaaaaag ctattttctc ttgttaattt tctactata tagcatttag 10740
 atccaaattg gtatgtgcta gcaactaata gctttatttt ctacacagtt gcaactaatc 10800
 tccaaagtga aaatgaatgt gcaactaata gctttatttt ctacacagtt gcaactaatc 10860

cagctgcctc ttatgtgaagg ctggaacctg acaccaaaact ccttatttcag ccaaagacac 10980
 gccgagccaa agagaatatac ttctcaaaag ctgatgctga atataaaaaa cttcatagtt 11040
 atggaagaga ccagaagaagg atgatgaaag aactccaac caagcaactt cagtcaataa 11100
 ctgtgggaat cactgaactc aatgaaaaag agtcagagat tccagttgac tcatcatcac 11160
 tagcaagttt atggactatg ataggaaagca tttttccct tcaactctgag aagaaaaaacg 11220
 agacactctg ggggtttaact gaaatcaatg cattcaaaaa tatgcagtca aaggttgttc 11280
 ctctagacaa tatttttcaga gtatgcaaat ctcaactcc tagtatatat aacgcgtcag 11340
 caacctctgt ttttctataa cactgtgcca ttcatgtatt tccatgggac caggaattatt 11400
 ttgatgtaga gccacagttt actgtgacat atggaaagct agttaaagta ctttctccaa 11460
 cagaacagca aagtaaaaca aaacaaaatg tgttatcacc tgaaaaagag aagcagatgt 11520
 cagacgcact agatcaaaaa aaatattagj- cagatcataa tgaagaagat gagagagcct 11580
 gtgtgctaca agtagtctgg aatggacttg aagaattgaa caatgccatc aataatacaa 11640
 aaaatgtaga agttctccat ctggggaagg tctgggttag tataaaattt taaccttggg 11700
 agaaaattta tgtgctctaa acatccocaa attatgaatt agaattagat ttcatatata 11760
 aattgaaaat caattaaaaa gaacacacgt cctcaaaagg ccttggggga cacattttag 11820
 ctttgcagta aagtccctgt ttggataaag atgtatgtt ttctggccaa gtaagcttga 11880
 atagctacaa gcttagatag gtccaggcca gagaggtcaa aattacttgc ctgagattgc 11940
 atagcttagg ttacaactag gattcaaac ccaggcagat gacttggggg tcatcattga 12000
 tggagtgccc tacaagacct cccatcttta atgtctgac atttgttccc cagttaccga 12060
 aagcaactgt ttaattatag ggaagaaggc cagtgtaggg agagatccat ggcatgaggt 12120
 aacctctctg ctgcattgtg tggcacctgt atcggaatgc atccaggagc tgcctacctc 12180
 gccggtgtct gctctttaag ctgtgtataa cggagaggaa tgacacagag cactatgtgc 12240
 tccagccctc catctctggc acaaatatta atgctacct ttatagacat aagtcactag 12300
 tccattttt ggaacctataa ttgaaacac tgtaaaagt gacttcatag tgataaagag 12360
 aggaactgt taggaagag aataaaaatg aaagagaagg ttgtctctct ttgtagattt 12420
 ttttttttc tcaaacctgt ttacctgtga cctttataca aataactgac aagcattata 12480
 tctcttttgc ctacatcatt ttcttttcta ttttttttt ccacaagatg caggtttcac 12540
 ttctttgccc aagctggagt gcagtggaat gatctggctc actgcacact ccgctcccca 12600
 cgttcaagtg gtctcctgc ctcagcctcc tgagttagct ggactacagg catgccacc 12660
 cagcgcctgc taatttttg taatttttagt agaaactggg ttccaccatg ttaggcagcc 12720
 tggctctgaa cctctgacct caggttgatc gctctcctg cctcccaaa gtgctgggat 12780
 tacaggcatg agccactgct cctggcggc ctacatcatt ttctaaagct ccagacattt 12840
 cttttctttt cttttctttt cttttctttt cttttctttt cttttctttt cttttctttt 12900
 ttctctttc ttctctttc ttctctttc ttctctttc ttctctttc ttctctttt 12960
 ttagaagctt gctttgttgc ccaggctgga gtgcagtgcc accacctcca ctacataaa 13020
 cctccacctc atgattctcc tgctcagcc ttccagatg ccgggactac 13080
 aagtgtggcg caccactcct ggctaatttt tgaattttta gtagggacga ggtttocaca 13140
 tgtgtggcag gctagtctgt aactcctggt ctcaagtgat ccgctgcct cagttoccca 13200
 aggtgtctgg attacagggc tgagccaact tgctgtgctc cagatcataa ttcttgttta 13260
 gctttaaact tgcctgtcag gagatccac tgcatcctca aattcaaaat atttcaactt 13320
 gagcttatga tttagctggt tctgtcataa gatgggaata tctctttatt tcttgaatt 13380
 tataagtga gaacaggagg aagtgtgat ggtaaagtcc tgtgattaag atagcaataa 13440
 ggactccgcc tctcccactc cactgaaggt tgaaggcca tggacaatga gaagtccag 13500
 taggtgaat caggtactaa aatggactgt gcttgagaga tcaaaaatga cactgtgtgt 13560
 atacaactaa caaattcatg ttaacttgaa cctttattac cctgtgaagc atgttgatta 13620
 aaaaaaaa caaacaacac aggaactgt attgttaaatt tctcttaaag tccaataatg 13680
 taccttagag tttttattta tgcctttgtc taccattaat atgtctgcac tgcctcttta 13740
 gaagttaata gagagtaaac tgcctttcagt gtcttactat gctttgggaag 13800
 ttgagaaaaa tttttaaact cattattgat atatatatat atatatatat 13860
 atatatatat atatatatat atagataatt ttttttttt tcttgagacat gactctcaat 13920
 ctgtgcacca ggcggaggtg tgggtggcgt cccacactca tgcaagctct ccgtccagag 13980
 tctcaagcgt tctcttgctc cagcctcccg agtagctagg atacaggctc ccaccaccac 14040
 gcttggctaa ttttttagt tttagtagg acgaggttc accatatgg ccacgttgtt 14100
 ctcaaaactc tgaacttgtt atccgcccac ctgggctcc caaagtgcgt ggtattacag 14160
 cgtgagccac tgcgcggcgt tgaggtaaaa tttaaagtgt acaatttcag catttttagt 14220
 atttttatac tagttgtaca gccatcacca caactcaagt ttgaacaatt tcatattagg 14280
 ggtgggaaa attttactct gctttttaga ttaagtttct ctctgagatt aacatttaa 14340
 tcaqacaatc aggcagtagt tctgtgatta gttttggcca tccacgcttc ttcattgggt 14400

gttactttc acaataaaag gctgctcaa gattagaaat aacattttaa ttgaatgtaa 14460
 atgtggcata gtttaaaaga tgggttttgg gaatacagtc aaatacatat attttaaagt 14520
 ctaattctga agattatgta aagaaaagga aagaaatgta gggagaggat tgaatgttc 14580
 atgggtcaaa aatattctgaa catccatctg gtcacacagt tggattttga atgttttggc 14640
 ctccctaaat tcatatgtctg aaatcccaac tcccaagggt atcgatttag gaggttgggt 14700
 ctttgggaag tgattaggtc atgaagggtga agccttcagt aatggggatt ggcgccttat 14760
 aaaagagaa tgtagagaaat aagtttctgt cgtttgttag ccaccaggt ttggaatttt 14820
 tgatattatg cgcctcagtg actgagacaa ctatgagtta ttatgaatgc ttcttgttatt 14880
 taccctaaat tcatagaagc taatataatc atatttatgc tatgaataat ttcttaacca 14940
 agccttgaat atattttat ttttgtttat ttttaaat ttcagattccag atgacctgac 15000
 gaagagacta aatatagaaa tgcattgcgt agtcaggata actccagttg aagtttacct 15060
 taaaaattca agattcttaa agttacaacc tagagagaat ttagttaggt caaatataat 15120
 tgttacaata aaattctttt acaagttttg taagatttct agttgttta gctaatgtat 15180
 aagaattgtt tattctcttt tgatacaaat cttttttat tgtgttaaac tatataat 15240
 ataaaaatg ccattgttcg cacttttaag tgtataatc aaaggccata attacacta 15300
 taattattga caaccatcac cactatctat atccagaact ttccatcac cccaaagata 15360
 aacttggtac ctaataaaaa taatctcccc gtccactctc ttccccagtc ctgtgtaac 15420
 tctaaagtta attgtgtctc tatgaattta cttatcttag acttttcaata tatagtaga 15480
 agtatgcat ttgtcttatgt acttgactta ttctacttaa cataatgttt tcaaggctca 15540
 tctgtgttgt atgtatcagc atgtttattc ttctcatggc tgaatactat tccattgact 15600
 gcacatacca cattgttata tccattctat tgttgatgga cacttgggtt gtttccact 15660
 ttttgctgct gtgaaataat gctcacgtga acattgggtg caagtatctc gtttgagttc 15720
 ctcttttcag ctcttttggg atataacctag gaattatgt taaattttg agaaagctgag 15780
 aaattcttaa taaatgataa cacaaatact tatatttgc aatgcaaaat ttgattttt 15840
 tggcctttaa gagattgact attttgcac gtggttgtaa ttaaaaaaaa ttgtcccatg 15900
 ttgtttcagt attaatattg tagctcaaaa gagtgcctaga ctgttttact ttcttaactg 15960
 ttaattcttt ggatactggt agagtcagga aatgagatatt tgaacttaaa gatctttgca 16020
 ggtgggtctc actgggctcac acctgtaact ctagcacttt ggggaagcga ggtggggaga 16080
 ttgcttgagg ccaagagttt gagaatagcc tgggcaacat agcaagaccc catctctaca 16140
 aaaaaattaa aaaaaaatt aagccaggcg tggtagctca cgctgttat cccaactt 16200
 cgggaggtcg agatgggtgg atcacttgag gtcaggagtt ggagaccagc ctggccaaca 16260
 tggtagaacc ccactctcac taataatacc aaaattatcg gggcggtggt ctaactctgt 16320
 aatctcagct actcaggagg ctgaggcagg agaaccact gaactgagga ggtggaagt 16380
 gcagtgaacc tagatctcac cactgcactc cagcctgggt acagagagca gactctatt 16440
 caaaaaaagt aaaaataaaa attagacaca tgtggtggca catgctgtca gtcttagcta 16500
 ctcaggagct gtaactgaatc gggaggatct cttgagccca ggagttccac cttagagta 16560
 gctatgatt tgcactgca ctccagccta ggcaatatct caaaaaaaat ttttttaat 16620
 agattattag gccagatgct gttgctcatg ccagtaatcc cagcactttg gaaggccaag 16680
 gtagcggagt cacttgaggc caggagtttg agaccagctt ggcacaatgt ctgaaacccc 16740
 agctctacca aaaaataaaa aattagctgc aatgtctata atccagcta ctggaggac 16800
 tgaaggcaag gaatcgcttt aaccgggag gcagagggtt cagttagtgt agactgcgc 16860
 actgcactc agcctgggagc atacagcagc attctgtctc aaagaaaaag gaatttgttt 16920
 tctctcttt actgtagagc gaggaaaagg agaatgggt ttggaattgt attgagtgag 16980
 ccacattatg ttagattgat cactgggcat agagaaaagg agcattttaa actttccgc 17040
 ctaacagatg ttcttccagg ctacactgca ctattgtgc taactgtaat gtcaaatccc 17100
 agacctgtgc ctatagaaca tgaacatctc tcaattggatt tgtttgttca ggcttaact 17160
 ttattaggaa gatcagatgt taaaaaatc tggttaaagt taagttcaga taaggagata 17220
 attcatctat attccttttt ctggcagcctt aaagacataa gtgagaagaa caataaaact 17280
 gtattttatt catggctaca gcagttactt accaccatgc ttcttttggg aatatcagag 17340
 gaagaattta ttaagctgga aactaaagat ggtgagtaca ttgttttatt tgaattttt 17400
 ttctatttaa atagtgtcat atttttaatt gttcttgca cctgtcatat cgtgttaac 17460
 tatgtgaata tggaaataata attatgataa ttaaacagta gtttttatgt attgaaaaat 17520
 atcttttgcc cgggtcagtg gctcatcgag gtaatccagc gactttggga gctgcagga 17580
 ggcggatcac ttgaggccag gagtgcgaga gcagcctgcc aacatgcgc cccactatct 17640
 atacaaaaaa tagcctgaca tagcctgaca tagtgtgta tgcctgtagt accagctact 17700
 ttgggaggtc aggcagagag atcacttgag cccaggaggt ctgtgttctt gccactgcac 17760
 tccagctcgg gcagcagagt gagacctgt tggggggaaa tctttaactt 17820
 aaataaattt gacatttaaa actctaaatc atttcatctc tgtttcagta ctaactctgc 17880

atttattact tctcttttaa taggactgaa ggaattttct ctgagtatag ttcattcttg 17940
 ggaataaagaa aagaatataaa atatttttct gtgagtgccc aattttgctgc agaagactac 18000
 aatacaagata atacgatgtt attgaatat taataaaaaa ctatttctga catatgattg 18060
 ataataaagt atgaagtctc ttgtaacacc ttgcattgtg aagtggtatta aaaacctgct 18120
 aagaatgaagg aataaacttta tttaaaatat ttattctctg aatctcttta aattatctgt 18180
 acaaatattt gacttaacct aaatttaaaa atgaatgcct tagcacaatt aggttccaaag 18240
 aatagaggttg atcatgttta ctggtaaaag gatcatgat taaaattctt ctgagattga 18300
 aacaaatgaa aacgtgattt taagggtttg atttttttaa tctctatttt cacatgcaat 18360
 ttctactgac aacctacttt attttgacag tctttaaatt cgcaactctt tagaatttga 18420
 atcagatcac ttctctttgc ttccataagt ttttttatta ttatattatt attttttttt 18480
 tttaaaagac ggtgtctcac ttgtgcgcc aggcctggagt gcaagtggcat gatacaggct 18540
 cactgcagcc tgcacctccc aggcctcagg gatctctcca cctcagcctc ccaagttagct 18600
 gggaccacag gcgaatgcc tgaatgcctg ctaatttttg tatgttttgt agagataggg 18660
 ttccaccatg ttgcccagaa ttgtcttgaa ctctgggtt caagcagttg ttctgccttg 18720
 cccaccacaaa gttgtgggat tacaagtgtg agccaactgc ccagctcta ctagaagtat 18780
 tttaagagtc atcttttttt ttttttgag atggagtctc actctgtcac ccaggtctga 18840
 gtgcagtggc acactctcgg ctcactgcaa cctccacctc ctgggttcaa gtgattcttc 18900
 ggcctcagct tccctagtag ctaggattac aggcgcatgc caccatgcc ttctattttt 18960
 tgtagtttta gtgagagca gatttcacca tgttgcccag gtgtctcttg aactcctgac 19020
 ctcaagtgat ctgcctctct cagcctccca aagtgctggg attctaaagt taaaccacca 19080
 caccaccgca agagtggct ttttacaata ttattttttg attaggacat ctacttctgt 19140
 cataaaaatt gaaatactct agtcatttag aatttctgt ttttggaaat cagaattgtt 19200
 tcttttattt tgaattgtta ttgaaggaa accattttag gaagatacaa atgaagaat 19260
 tgttaaaaagg ataatgtga cacaatacaa aattataga aaaaatacat ctgtaaaagt 19320
 tttaaaagca ataacattct ttctgcttgt tgaccataaa tatttatatt ccttggtatg 19380
 gtacatttgt attgtcaagg gtgtttaaat aatgatcttg catgcataat ttattctctc 19440
 tgggtataaca gaatcagcaa tttagtttct tgggacccga gaaaaacag caaaagacat 19500
 actttgaaat gtaaaaactga ttttctctg caactcgagg tctctctaga tttagtgta 19560
 aagaagaana acagtggagg aattgacttt attcttctct ttttaaaagt gagctctttg 19620
 gggtaagaag ttatggccaa actagcatgt tagacatggt ttaaaccta tatctggcag 19680
 agttttcaat gtaaaatatta aagtagatgt taatgtcaat aagtgacttt aataatgcat 19740
 cagttagatatt tttttcaagg attgtctcta tcttccagcc tagcttataa ttgctctgt 19800
 cgtctctttt tttttctctt tatttttatg ttttttcca tccctgggtg taggggataa 19860
 ccttgctctc ttcgataaca agaagtctga agcttattag aaattttact ttgagaattg 19920
 atctgatgaa agaaagcaac tagatatcac gtggatcata tatgcttgaa taaaacaata 19980
 attcttagaa caaataaata cattttaaaa tttaaaagca aaaacattag ttgaaatggt 20040
 aaaaatattt caaattaaat tattcttcca ctgtcttgta ttactgtaat aatttggatt 20100
 atttgtgttt ttctcaact tttaaacaaa tatttaaaaa attctctttt tgattaaagta 20160
 gggctagata aaatatataa aatatttttt aaactctctc taatttccat attcttataa 20220
 taatatgaga atctcttata aacactacct cttagaagt cccacagaag ctttggtaga 20280
 tgttagtaga gggattgat ttcttagaat ggtataatct gtaaatgttt tagtaaaaag 20340
 tttaaacagat aaagtcaaaa tgtttatagc acagtgttta ttaataaaa staaaatctc 20400
 tttttttttt tttagagattg actctcaact gtgcaactag gctgagtggc agtggtgcaa 20460
 tctcagctca ttgcaacct gcctctctgt gttcaagcaa ttctctcgca tcagctctct 20520
 aagtagctgtg gattcaagc atgcaccacc acactgcct aattttttgt atttttagta 20580
 gagatggggg ttccactatt tggcaggct ggtctcaagt gatccgctg ctcaagcctc 20640
 ccaaaagtct gggattacag cgtggaacca ctgtgccag cataaagtaa aatctctcca 20700
 gactctcatg tgcattatga aagtggcagg cagtcaagct caagaagtga tttaaagttc 20760
 atgtttgtaa aaataaatct acagattgat actggtttc ataggtaatg tttaagagaa 20820
 aataagtttt tagtttctct cgtacttcca aagaccoca ttattgtata ctgtattac 20880
 taaactaaat catttggggg ctgaggtgtt ttttttatgt gtttagtttc cttaaggagt 20940
 tctattaggg caaaaactttt gtaactctga tattttaaaa gtaataaac taatttttaa 21000
 agcttggagg ctggggcgcg tggctcacac ctgtaattcc agcaactttg gaggccaagg 21060
 cgggtggatc acttgaggtc aggagtttga gacgagctg agcaacattg tgaacctgt 21120
 tctctactaa aaatcacagaa attagccagg tgtgtgggt ggcacatgta atcccagcta 21180
 ctggggaggc taaggcagaa gaattgctgc aacttgggg gcagaggttc cagtgcagcc 21240
 agatcatgcc actgcactcc agcctgggtg acagagcaag actcgtgtc aaaaaaaa 21300
 aaaaaaaaaa cgttgaagtc agattcgaca ttaacagta tactttctct caagtagggg 21360

acaattttcta agatttttagt cttttaaaaat ttatttaacta gtctgagcat ggtggcttgc 21420
 gtctataaacc ccagcaacttt gtggggccga ggcagatgga tcaacttgagc ccaggaggtgc 21480
 gagactagcc tgggcaacat ggcaaaaccc cgtctctaca acaaatgcac acacaaaaaa 21540
 cccaaatcagc tgggtgtgtgt gtacacatcc tgaagtccca gctactcggg aggtcgtgagc 21600
 agggagatca cctttggccag ggcttttgag gctgcaggga gctgggttca caactcgtgc 21660
 ctccagccctg gatgcacacg caagcccctt tctcaaaaaa aaaaagataa aaattataat 21720
 taaaataat aactcaactg ggaaggcaaa attcagcat tttttatgc taatttttat 21780
 cctgcttcag tctttttatca tgaactatgt tataattttt acagaggagt gaattcccta 21840
 gggatcatct cctttggagca catcactcac agctcctgg gacgccctgt tctcgcagct 21900
 ctgatgtctc ttgtttgcag acttaggaat ggagctcttt tactcacagg aggaagaagt 21960
 agtggtttaag gtgtgttcat ttttctgtaa catttaataa ctttctattt attcttcttt 22020
 gggttttgac catctattat atagggtggg ttttgacat ctattataa gggttataac 22080
 gacataatga aagcatctat ttattcacta atatttctgt gtgtctgctt ttaggtgtgt 22140
 ggggatgtgat gacgaataat actgatgttc ccaatgccct ttttctgtgt cagtgtat 22200
 aattatattg ttttcttttt tttagctatt aggtgttga aggtttagt aaactacaaa 22260
 tgttgaacca gcccttgcata cctgtgataa ataccacga gtgtgtgtgt atcattcttt 22320
 ctacatttctc gaggtttatc tgcataatgt cgtgtgagct tttgtccatt taagtgttga 22380
 agtgatttag ttgcagtttt cgttttttgt gttgtctttg tctgggtttg ctactccgtgt 22440
 aaatctggccg tcataaaaat agatgggaag tattctctcc tctctctgt tttttttga 22500
 agaggtttga taaaattgag gctgaatctt ggtgtgtgcc acaattgcag gacactttt 22560
 tgtgactgaa tatatttgga attcctataa agcaattatt tctcaggvaa ggggaaaagt 22620
 aacttttgcc aaagcaatct gtaaaagaag atttgcaaaa ctggatgcc atgtggagag 22680
 agttgactgt aaagctttac gaggttatgag tatggtataa cctatataa atcccttttt 22740
 cattagaaa acagcatctgt tatacataat gctgtaaatc taataaatc acatatac 22800
 tagtctttaa ctttcttgt tatcatatag taataaaaat tcttttgctt tcttaagt 22860
 ttgtgtataa ttctcaaaa cttccattat tctccattat taatggaggg cttgttcttt 22920
 aactttttgt agactacatt tctggaaagt cctcactgaa ccaactgtga aaattagtag 22980
 ttagaatata cttctaattg tataaaatgt cctgtaattg ctatggaaaa cttggagaat 23040
 ggttgcttca ggggagagaa agtaggaggg tctggagcag aatgaggaga attcacgttc 23100
 accatataac acttttctgac ttttaaaagt ctttaacatt acattattat ctattcaatt 23160
 aaaaaaatt gggagagatt tactttgaac agttaattt tcccccatgt gtaccgtgt 23220
 catatagttc caactaatca tgaacttgtt fatttctgt tctttgaaa tttaaacttt 23280
 gtaactcacc aggaagtttt aagccaaatt tgtgtttcaa atatagcaac tccaggtatc 23340
 ctaggcagat gctcattctg ttgattttaa atgaactttg atcccttact ctacttatg 23400
 ttttccccca tctacttttt ttatttttgt tgaagccat ctaaaattct caatgggatg 23460
 aaactgggta taaattgaata catgcataca ggaattatag tagcatatc cttttctttt 23520
 ttcttttttt ttttttttga gacagagtct tgcctgttag cccaggtctg agtgcagttg 23580
 tgcgactctc gctcactata gctccacct cccaggttca agcaattctc gtgctcacc 23640
 ctcccgagta ttgtgggacta caggtgtcatg ccaccacacc tggctaaatt ttgtattttt 23700
 tagtagagat ggggttttca catgttggcc aggtctgatc caaactctg caactcaaagt 23760
 gatctgcctg ccttggtttt ccaaagtgtc gggattacta gataagcca cctgcactgt 23820
 cctcttttt ttgattttat aaaaatttga actttactgc acgctttgat actgtattaa 23880
 ttgaacctgt ttgtgaaca agtttttgt atgggtatat taataaaaa tagatcaaat 23940
 tttttatagt aaatacaat cgagcttttc tagtctttc aaaaaggcaaa ctgaaattt 24000
 cccagcactg aaatgatact gaaccattt catatctct gtattaaaga aaaaggctt 24060
 aaaaactata aaaaacccta gagggtgctt tctcagagg agtgtggatg cagcatctg 24120
 ttgtctctgc ggaatgacct gacctcatt ctggactgcc tgcgtctccg gaacatgatg 24180
 acagctctga ttgcggtgcag agccaagcgc ttgctcatg taaatgcatt ccaactcgtc 24240
 ttaaggtctt tctcttttgt cagtgcagat ttttagtctt acaataaaat ctaactctt 24300
 cagagataaa tatattgtgt atgtttaagt ttgtgttga ggcocctgat ggcattctac 24360
 agtgtctcta tagactctga tagcaaaatt ggtagagtaa acaacagtgt aaattctgt 24420
 aactctcatg ttatgtcttt aggtttttt attctctctt actatttgt taattttacg 24480
 atttactctt ttgtctattt gacaaaatt ttgcataat ttgtgcacag tctgtattct 24540
 caaattctag gagaaaaaga aggttgaaca gtattagcgc agaacgatc taataatgat 24600
 gggactctgt ttatgtagag cagccctttc ttggctttct ttgattgtct tgtattctac 24660
 atgaagatat tccctgggct ttacaggtca ataaatggaa actcagagag attaaattga 24720
 ccaggtgtac caacaaggag atgcagcat acactatgc agaagtatc aaactagtag 24780
 gtaggagcat ataactaaa ctgggggtga ggtgggataa ggagtattca gggaggctt 24840

ttgtgaggag ttgacaactg agccgagttt tgatggaaga gtgaaatata gcatgaacca 24900
 atttcatgct aataaagaag caaaggaagc gtggtctaca ggcaaaagca caggaggtaca 24960
 ggaagttaat atatgtgtgg gaataccctg ttgactggag cttagagtgt aaggagagga 25020
 gtgctaggga ggtgaggttg gaggggttgg cagcatgtac ttgctccaag gtctcttaaga 25080
 gctgaaatag tacaataaag caactaagag ttgctgtgat tattattacc tagttgtgta 25140
 atctcaaat ttgaatctca tagcatctat aggactgggt ttactaatct taccactcgat 25200
 ctgttactgt tcttatacta gatctattag tccagtgttt aaggaggtgg tgcagatttc 25260
 taggttcagg caggactcag atgtacatta ttaagtctta ttocagttct gacctctcca 25320
 tatgaacct tataaagact ggggtaggaa gagatgttct tggaaagtac aggaataatga 25380
 actgtatttt gttaaacaac caatcacgta tggaaattta tcaacctctcc agaatattta 25440
 ttctgagttt ttctcgttca cttctgttca aagatccacg atatgggaac 25500
 ctccactagac attgctctga gtatatgttc tgagtttgca gtacctcttg tctctccatc 25560
 agattttatta ggtctccaat agataaacta gggaataact agatggattc attttttaaa 25620
 gacatgaaag agcgatacca tacatactgc accttaaaag tcaaccttag agtatcatta 25680
 ttttttaatga atgtataatt tttaaatctt atgttttact ttctcaagct ttgcatctat 25740
 attgortaat tccagctttg aatgatatga taaaagagt ttctcccatg ggaagtttgg 25800
 ttgcatctat tgcacacaag cagttctcagc aatctctaca tcttttactt gttttctgct 25860
 aaggagttca ctatattcag ttggtccaac acattccagc tcttaatacag gtaatacctc 25920
 actgttaagg atattatga tatgtccctt ttctagaaat tattttttca ttttatagtt 25980
 aattctgggc ttgtttttta ttgtctcttt attgatttta aggatattga agtacaacct 26040
 tgggtctcat tgtgtctagg gcataaatta taattttatg ccaactgaaa tgttagttat 26100
 cgcttctcaa gaaaatgact tttttgaaaa ttgattttgt ttgaatggag aagaacacag 26160
 agaaatagat agatggcttt taaacacttc attaatataa cttttttttt ccacactaac 26220
 ataatggcac ttgctccct ttgggaactc atgaggttt tagtggtagt tagtggaaac 26280
 aatatgtgtc caggactggc aaacattctt taaattcttt aaaaatttca cctagcatct 26340
 acccttaata ctgcacctct gtgctagtta actgctattg aagaacaaaag gtattatctc 26400
 tattattaaag gataatagaa ttgtatttga gatattgttc attgaatatg aatatgtttt 26460
 gagaaataag ttgtattaga accaaaaaaa aattctttaa ggaacactat attactaaaa 26520
 atgcttctta ttggagaag aaatgacaa acattattaa ttgtattttt tcaacaacttt 26580
 attaagatat aatttaagta caacaaactc acataaaagt tacaatttga tcagttttaa 26640
 catatgtaga tgccatgaaa ccatcacacc aattaaaggaa acaaacattt tcatcactcc 26700
 agaagtctcc tagccctttt actaccactt cctccctgct tccatcccca gacaactacc 26760
 aatttgcttt ctgctactat agatttgcca acctgatttt ctccaataat gaaactaaaa 26820
 atatacagtt atatacaatt ggaaatttga attttgggt ttttttctta ccaacaaaaa 26880
 tgtgaaatt ttgttaattgt aataaaaaat aaattggact gtgatataaa caagtccacc 26940
 gatcttgacc tgcagcatgt agctaaagaa actggcggt ttgtggtagt agattttaca 27000
 ttaactgtgt atcgagccat acattctcga ctctctcgtc agagtatact caccagagaa 27060
 agtatgtttt actattaaaa cctgaacttg gaattctctt tctatttttg agaaattgaa 27120
 ttgtagttaag acaagaatta aatatattcc attgtagtat ttgaaataagc agttattgta 27180
 gtagaataatt agtgtttcca gctaaagtga ttgcatattt tgaaataatca tatagtgaa 27240
 ataaactaga aaagaagttt ttgtttattt taaacagaat tagtttttaac aaactgtgac 27300
 ttccaaaagg ctctccgcgg atttctctct gcgtctttgc gaagtgtcaa ctgcataaa 27360
 cctagagacc ttgggttggc caagatttgt gggttacatg aagttaggca gatactcatg 27420
 gataactacc agttactctg caaggtatgt ttaaaaaaag aaaaagtga tactactctc 27480
 cagaagaacc actgtattat ttgctttggc ttatgtgtc agcttgccca atctccgtgt 27540
 agtccaacaa gtgtttactg agttaccaaa taaagtctct aacactattt taggtatttt 27600
 aacaaaattt aattttatca attaatttt tattagaatt gagacctcac ttgtctatct 27660
 aggtctgagt acactgcagg ctcaactgaa cctcaactc agctgggtcaa gcaattctct 27720
 tgcctcagcg tccccagtag ctgaactac aggtcatgac caccatgccc ggccaaactc 27780
 ttaattttct tagagacgga gtcttgcatt aggtcatgaac caccatgccc ggccaaactc 27840
 tgaatgcagt ttgtgatata agaaacttat aatggaaaag tgaaggtgat ttatcagtaa 27900
 atacatttt ttgtataatt ctgtttgtct taactcatca aatttgtagta aagcaagatg 27960
 aactgtctgc atgattttga gcgaaaatgg actaggaataa actagaggtta 28020
 tcaagggttca caggactgat ggggtgaagc agattttccag acccgggatg tcaagtcctg 28080
 aaaaagcagc ttggcagcca tagacgaggg agatagcagg ataaagggag caaatgtaga 28140
 ttgttcttca gaagatcaga ttgttaggtc taggaggtag ttgtgtttta ctagagatct 28200
 gagaggcaaa gatcattgca ttgagtcagg gacctatgca aaggagttga aaaaaaactc 28260
 gggtttaagga gctgtctgca ttgcaacttc ttggaaacag tggcaactgg gcttgggaca 28320

tgttgattgc agccccaggac tgttaaaacc agtgtgagag aacatgggta tggaaagtact 28380
 agctagcagg atcatgacc cgtagctggg atgggggcatc aagcatctagt acatggagat 29440
 tcagtaacatc cagatgcagt acatggagac tatatgcgta actgctgact ttggggtctt 29500
 tcagatttgg agcagagagta gaggtgagtg ggaatatctt caatagagggg aacataaacag 29560
 gcataccataa taaaggagac caggatatgg cagacagtag cctcatgttt ggctcacctg 29620
 tcaaaaaagt tctcttgttc ttgagcagtg gtgccttaaa aggtaacttg agaagcagtc 29680
 gattattttg tcagcctggga gactcctggg atatttttact acctttgtact gaatagattt 29740
 aaatgcacac aggtctccta acttgcccca tgaagcatac ccatgaaggg cactatactt 28800
 tgraaaagat tggtttgtac tttttaaagt tagtaacttt aataaaaacag gaataagatt 28860
 agttctgtat cagttatatg cattttatat agaattgttt ctttaattgga aaaaatttgt 28920
 cgtagttcct ttgagttcat ttacagtttt tagtaggaat tgtattttct actgtttgac 28980
 ttgctgtttc taaagaaga tggctgtgat taccatctga attttttttc tatacatgga 29040
 tctttagctg ctacttagtc atttctgttt agacttgagc tctttttcat attttttttt 29100
 ttgttttctc agtatccaga attattttgca aacttgccca tacgacaagg aacagggaata 29160
 ctgttgatgt gtccgctggg aacaggaaaa accctactag ctggggtaat tcgacaggag 29220
 agtagaatga attttataag tgtcaaggta tgttgtctac ttatcttctt tttttattta 29280
 ggtaaaaata acataaatgc agttagccat ttcaaaagtg aaatctcact gcatttagtg 29340
 cactcacaat gctatgcac accaccctct ctctaatttc aaaaactttt cattccactc 29400
 ctctctcttg tttatccctg gcaaccattc atctgtcttt tgtctctagt gatttttgtt 29460
 ttctgtatct ttcataaaa acaaatcatg caatattgga ccttttttct ctggctcttt 29520
 tcaacttagt aatgttttca tggttcatcc aggttagtagc atgtatcagt actctactcc 29580
 ttctgtagtc tgaataatgt taccacactt tgttatcca acttatcagt tggacaactt 29640
 gaattgtttc taccttttga ctattatgaa taatgttgtc gtaaatatct actgcacatt 29700
 ttctccacgg atatagtttc atttctcttg ggtataaacct gaggagttaga atgtctgggt 29760
 cttagggtaa ttctctcaact ttccaagaa ccacccaaact gtctttcaca caaactgac 29820
 cactccactc agcagttgtgg ggggtttctg atttctcaca ttctttacaa caacattatg 29880
 ttatctcaat ttggggctagt ctacacattg gaaagctagt ggggagcagc atccatctat 29940
 taaaagttgt atgaattgtc gtaattgagc accctctctt ttgagggtct attatgtctt 30000
 tgcctaaagg aatcttcatg catgtgtaac agaattatac ataatgtctc agataaaaag 30060
 gcaaacactt cttaaaaggga gtagacaact agaggcagga gaccatactg aggcaggaa 30120
 ctgggggttt tatgtttctg ttacttttga ctatatctca ccattgtctt tgtcaaaagt 30180
 agactaggtc taagtttttt tcaggtataa ggtgagtggt gtaattaaag ggcctgctag 30240
 cagatcattt tgggttaatgc ttacagatcc accactggtg tgtcattgtg gtccgagatc 30300
 cagtatctta gctgtgtaat ttcagacatc agcaatatta gtttaacaaa gggcacaatg 30360
 attccaagac aaaggaaatcg tgtattatct tagccttatt caaacttgat ttataaatca 30420
 gtttagtaat ttattttatt gtttctgtat ttatttttat ttctttgaga tggagtcca 30480
 ctctatttgc caggtctggag tgtagttagt caatcttggc ttactgcaac ctctgccccc 30540
 tgggttcaag ctattctcct gctcagcct ccgagtagc tgggagtaca ggctaattt 30600
 tgtattttta gttagagatgg ggtttccaca tgttggccag gctgtctgtt aactcctgac 30660
 ctogagtgat ctccggcctg tggcctccca attttctggg attacagacg tagctaccg 30720
 tggccagctc agtttagtaa tgtataactg ggttttacc agttgtaaat tactcttttg 30780
 tctgtttttt ttgaaactg gcaatgacgg agaaaactaaa agtgccaggc tgttgcctg 30840
 tctctgttat ttgcttagt tttttttttt tttttttttt ttctctgaga ctgagctgtg 30900
 ttgtgttacc aggtctagat ggagtggaat garctcggct gactgcgaac tctgcctct 30960
 ggcctcaagt gattctctgc tcagcctccc gagttagctgg gattacaagg gctgcgaac 31020
 gcaccgggtg aatttttga tttttagtag agacgggagt ttacacatgt ctgcaggctg 31080
 gctctgcact cctgacctca tgaatccaca gcttggcctt cccaaggctg tggagtaca 31140
 ggcgagaacc accgtgcocg gctctgocct agttattctt tgtctctctc tctagtcca 31200
 tagttctctg actgtattga gaaatgttaa ttaaatata tttatgttaat agatatttat 31260
 tgggttgaa attagaaat ccttattttg gtacacatc gtacacagta tgtgttcttc 31320
 tggagatagt gatttttoac tagagatgac tttaggact attcagggtt ttttaagat 31380
 cccaatttaa ggaagttga ttctcattat tgatttttgt atatgcagg aaatttat 31440
 cgaagggttt tttagttggc ttttagggaa gattataat tctctttttt ttttttggc 31500
 cttttccacc atgttctaaa aatgatatat tctttaactc ctatgaaat acattgtttc 31560
 agtaattgaa tgtctgatc aaagctatat ctctacacat tctttaaaat ttgagataga 31620
 tggagacttg tccctctcta caccattcac ttattcaact ggaaaaacta ttatccaata 31680
 ctatttgggc agacactgtt tctggcacaa ggtgaacaaa actgcctctt 31740
 tggagtttac attctactag tggaaagcga caacaagcag atagacacat tcagtatata 31800

attcactgtc agatgggtggt ggtaagtcct atgtaggaag aaaagcaggg taaggagggt 31860
 tggagtaact ggagtgagtc atagatggac ttgtcaggaa aggggtttctg aagaggtggt 31920
 atttggggag gatctcaaat aacaagccat gagaatatcc gggggaaaat 31980
 gttctgggca gaagatcaaa gcatagaaat tgggtatga tatttattct agcacacat 32040
 aattttaaaa atgtataaaa gacatccatt taatcatatt aaagatttcc atgatctat 32100
 tagactatgt cagaaaaccaa atttattatt tctttttaaa taattttatc tcaactctta 32160
 ttttaccocaa tagggggccag agtctactcag caaatacatt ggagcaggta aacaagctgt 32220
 tcgggatatt ttatttaggt tggtagccta tgaatgtttt taaagtaact gactctgtta 32280
 ttattttaca atcagtgctct tttttggctc tgttttttga agaatgtata ttgtgaacct 32340
 gtggttttat tgaattatta ataaagctaga ggagctggat tctctatttc atcaaaatat 32400
 acaaaacatt ttatatatta aattttggaa attatttgggt ttgtttttac aatgaataata 32460
 ctctccaaag tggaaatcgaa gtggttatto aaagaaatct cagagtagat tcttatatga 32520
 agcaaaataat tgccctcaat ttatctctaa attttgtaag ttctaaattc ttttttcccc 32580
 cagtttctaa ttattctctt ataaagcagg agtccatctg gccaatttaa ttccagtgag 32640
 tgttaactatt ttgcataat taaaaaacgt tatatgaata cagaagatgg tattttaagg 32700
 tgaataataat tattcaaat tgatagcatt atggggaggt ttaaaaaaaa agttactgtt 32760
 ttatttcttc aaaaatttta ttataaagta tacagttaag agaataatac taaaatacat 32820
 atgcagctta aggaagaata ataaaaatga tacttcatgt attcaccacc gagttttaacca 32880
 ggaaaagaaca taacacaaat aaacctcttc ccagtaattc ctgggtttaa ggaagttat 32940
 agtggaaaaa atttgggagc aaacgataat gaaaaacta tccattaaaa ttgttagatg 33000
 ttgcaaaact gatttcaagg aaaaattata gtgttaaat tttagaaaaa aaaaaaggtt 33060
 agaagttaac cacttatgta tctatctcat gaaattagga aaattataga tatcaactaa 33120
 aaaaatgttt aaaaaggaaa taataaagat aagaattgaat tttaagttaa cacaacaaag 33180
 agaagctcac aaagccaaag ttattttttt gaacaccgag tacaattcaa aaactcttaa 33240
 caagtttgat taagaaaaaa gaaagcatga ataaacaaat ttagggtata aaaaaggaac 33300
 atcgctcaag atttccacaga aatgtaaaaa ataatatgga aaatatctcat 33360
 gcccaatcat ttgaaaactt aggtgacata gcaaaaaaca aaattgacca aaattgacca 33420
 aaaaagaac aaaaattctgag tacttctgta acttagttaa aattgagtta gaaaagttaa 33480
 agaagttctt acacaaatca aacatcagac tcaattttct agggagagtt ttgccaaacat 33540
 tcaagtagca gataattctg gctctatttt ggcccacaga gatatatttt acttgccatg 33600
 catttaatga gatagctgtt gatttttttc aatcacctgt acaggtgttt tatattaggt 33660
 gttattcgcc agacatctag tccacctgtt gccagatatg gaattaaat tcaactattt 33720
 tgaattaaaa ttgtttaata aattaataaa acaagtcaca agttcaaat attaaaaag 33780
 taaaagaaat aaaaataatt ttatagagag cccctacaaa acagtaccaa cataatgagc 33840
 ttcccaaat ttgaatgggc aaaaataatg aataggcatt tcaaaaaaga aggaaggggtg 33900
 gcccaataagt atataatta ataaaaatgg ttacttgtaa taggaatcaa aggtgtttga 33960
 cttatttgact aagagctcagt ttctgtttg atccctgtta gtctatccag aagggcatgg 34020
 tcttataaaa cactctgacc tcaacagttt actgaatata agggtraatt catatgcctt 34080
 gccctcttta agggtttgtt gtaaaagatta aataaaatc ataaatatat ataaatacat 34140
 ttatatgtat ttatagttaa ctgacctct cttaagggttt gtgtcaaaaa 34200
 ttaaaagaag tatataata tatataata catataataa atacattcat atgatgtat 34260
 gaaatcact ttgccactat gaagcctgar tcaaatatga aatgttgttt gttttccca 34320
 gagcacggc ttgcaagccc tgcattcttt tctttgatga attgaaatcc attgtctctc 34380
 ggccgggtca tgataatca ggaagtacag accgagtatg taaccagttg ctgactcagt 34440
 tggatggagt agaaggctta cagggttaata attataaata cagaataatga atgtttaaac 34500
 aaaaatgcac cttttctgta gattttggtt aaaaaatgtt cttttttct cataggtgtt 34560
 atgtattggc tgcataatgt cgccttgact tgattgaccc tgcctgtctt aggcctgttc 34620
 gactagatga tctgtatata tgtcctctct gcttagcagg taactattca ttattagat 34680
 ccaaaaccca acaaaatgcta cactcttctc ttgtgagctt tactctgcc aggttaatggc 34740
 aattgtctt agaaagccag ctttcttagg gaaaagcctt gccaactgtg tgcataaacg 34800
 ataaaagaat tctgaaatag atcgaagcc tttttttggc ccagtgcaag tctgaaaact 34860
 ttgtaactat tctgtgttgg ctgattgggg gcaaaaaaac taatgtatta 34920
 tattttctca ttactctctg ttcaagagct acatacttcc atttccctgt caaaaaaaa 34980
 actctgatac agaatacagc attggaatcg taagcatgta agcaggtttc atagagataa 35040
 tttttcaact cttctctgtc ctgtgttgtt ccaactctta ttctccaat tagaagcaaa 35100
 caaataatgt aatgaagaaa cagatagaca aatgaatagt caaaggtata aagatattctg 35160
 atatatgtta catgtagata ttatttaaat tctcctttga ataccctctt 35220
 tggcacactt gctcaaatct agaaaataag cactgtgtga atagaanaat atttacactg 35280

aatattttgt aggttttttg gtttttgttt ttccagacaag gtctcacttt gtcaccaccag 35340
 ctggagctaca ctggtacgat cacaactcac tgcagcctct atggcccagg ctcaagcaat 35400
 ctccccacct cagctcccgc agtagctggg accacagcca cagcgtacca tgcccagata 35460
 ttttttttat taattttttg atagagatgg ggctcccagg tggttcccag gttctcttga 35520
 actccagggc tcaagtgatc ctcccacctc aacctcccac agtgttggga ttacaggcgt 35580
 gagccaccat gccacgcctt aagagtgttt gattttcatt cattttccca tatattattat 35640
 ttctgttggg gaaaaaatc caaggaagat aaatagtagg ctgttggtag attctctaac 35700
 ttactataaa agctttttta atataaaagg ttaattttat gaagaaatca taagatacac 35760
 aatttaagat aatattttta attttatttt ttatttttta aataaaattt tctctcttca 35820
 ggtgtcacgt cttgaaattt taaatgtcct cagtactctc ctacctctgg cagatgatgt 35880
 tgaccttcag tgcctttact cagtaactga tgcctttact ggagctgatc tgaaagcttt 35940
 actttacaat gcccaattgg aggccttaca tggaaatctg ctctcgagtg gaactccaggc 36000
 aagtatatgt aggaagtgtt tatgacattt tatgagtgat aaaagaagta caatgtcaaa 36060
 atttccacct taaaaaatgc tattttttaa acaactttgg taaaactgtt tagaacaata 36120
 aattttacct tagttgaatg ttccatagtt ggaatatggg ttttgcagag aatttataat 36180
 tatgaagtgt gatgtctgtt tctttaacat taccttaata ttggcaaaaa catgttgggtg 36240
 tttgcaagga tattattttt attgggatac catgaatata atactacaaa caaaaaatat 36300
 tagagttttt tgttttggtt tactttaact tttaaaaaat aatcagtttaa agtgttgggtt 36360
 ttgaagctca cattgttcca atctggccaa taggagcccc ttttgtatgt ctctgttatac 36420
 tttatgacat gtctctatca ttcttgaact acttctccac tcccagatac caaagtttat 36480
 ttttggccag gtccagttgt tccagcctgt aatcccagca ctttggcagc cgaaggcagg 36540
 aggatcattt gggcctagtt tgagaccaaa tcatgtttgc acaactgtta cccactatgt 36600
 caacacaggt gaaatcttgt ctctgtgaaa aatttataaa ttagtgtggc attgttggcag 36660
 atacctgtag tctactgtct ttgggagagg ctgtggcagg aggatgcctt agtaataatcc 36720
 aggatcagtg gacgatcgt tgtgccactg cactccagca tggatgacag aatgagaccc 36780
 tgccccaaaa aagaaaaaat attcttgggt tatcttggat ttctgttatac cagccctag 36840
 ctacagcctt tctctaaag acagtattat gattttaata ttacagtagt atattttgac 36900
 tgttatcata tagactttac catataattt ctaggaaagga ttattctatc actctctctt 36960
 accacatttg tttggaatgt ctacagaacc tacagtctct aaatcagaaa ctccctaggt 37020
 tttgtctatt ttggcaagcc attgaaagtc ttccctctcc ctttactacc agaaaggtgt 37080
 gtattttgat agctctctat aatgagaaa cactctataa catggttgat tcatcatttt 37140
 ggagtagaaa agtatgaatg gaaagtcaga gacataaaaa taagcccag aggtctgagt 37200
 cttagcttca ttacagactt tcttggggga tgggttggtaa attatctaca cattctatct 37260
 tgtctttata attttaatag ttaaaatttt accatgtgcc tcaaaccctg tagagaatta 37320
 atgagctctt tgaaaaatgc ttctaagttt ctgttatgct tctaatagaa tgcatactat 37380
 gttattattt atttctgaga ctaaaaattgt ttactctttt aaactggttg tcttttgggt 37440
 tatttttaga tgggaagtcc agctctgata gtgacctaa gtctgtctca tgtgtcttcc 37500
 ttaacctag cagtggctct gacgattcag ctggagatgg agaattgggc tttagtcagt 37560
 cccctgtttc tttagagatg tccgagatcc ttccagatga atcaaaatcc aatatgtacc 37620
 ggctctactt tggaaactct tatgaatcag aacttggaaa aacttggaaa tctgatttgg 37680
 tatcttggct agtcatcatt atacagttct gaaataataa gctatatgtt ggtgtaaagt 37740
 tgcaagtatt tctctctcaa ccagcccacc atattctccc tggttgggtg gtctctcagt 37800
 aaaaatgtct tggttcttgc ttacactaat tggtaatttg cattctctgt taagattttc 37860
 aagcaggggc tgggagcaag gaaccaaaagt tggtagtacc ttgtgtttct 37920
 ttgaggtttc tcttacctag tggctttaaa acatctttag gagcagttcc attttatagt 37980
 aaacttaaat tctgttatca tgaacagttg aggataatga ataattgat acaataatgt 38040
 aagaaattcc tgaaaaaaaa gtgttatctg tgataacttt gctgcatagt aagcacaatg 38100
 aagtgtaact ataattgttt aacaggaaga tgttttgggt aaatgtgggc agtatcaactg 38160
 ttctactagg atccaactct tctctaaaaa attaatagtg gtccaactgta attttattgg 38220
 tacatgtaac attcttaocat gtgtttgggt ttctataagt ttccctgttr ttgtacaatt 38280
 tgccttatta atttaggctt tttttttttt ttttttttga gacagctcca cttctatc 38340
 cagactagag tgcagtgcca caattatggc tcaactgcagc cttgacctcc tggccttagg 38400
 tgattcttcc acctcagcct cctgagtgcg tgggactaca ggccacatgcc accatgccca 38460
 gctaattttt gtaatttttg tagagacagag gtttcaacct attgccagat cgtgtctcaa 38520
 actcctgggc tcaagctatc tgcgtgcctt gacctcccaa agtgtctgag ttacaggtgt 38580
 gagccacat gcttagctca actcagactc taaaaaatata aaagcaatcc attttatct 38640
 ccaagaacag taaggtgggt gtttaatttt agtctttaat tctgttttta attttatcta 38700
 tttagaattg tcccagaaac ttagtataac ttactttctt gaaaatgaag aaacctgtcc 38760

ttgggcatta	gtgtgttgga	ttaaagcaac	aaagttaaaa	aaacctacc	gtgtttatg	38820
caattttcac	ttgatgggtg	ttctataaca	caggtatcag	tgaaccttta	ttaaagatga	38880
acaacttttc	agcttgctta	atttcagtta	attacaatgt	atacttatct	atgttaagt	38940
tttatgtctt	aaaatgttta	atttttatat	ttggttaaaa	gatagttttt	tctctccccc	39000
tcttctcttc	atctttcatt	actacaattt	acctgacaga	gctcacaatg	tctctctgca	39060
ccaagctcca	tgaectcagg	tttgcttgga	gttctctggg	aagaccaggt	gttttcacag	39120
cctccagttg	taaggacagc	ttcacaagag	ggtttgccaa	aacttacaca	agaaacaaga	39180
gatcaactga	gggcagatat	cagtatattac	aaaggcagat	accggagcca	agctggagta	39240
tggctttttc	ccctctatta	taattgttaa	aactctttaa	aaattgtttc	aactttttga	39300
tatatatttc	tttgacttta	aaacgagcta	tatttataaa	caagggacca	gaacacatta	39360
actcagtcac	ggttatgtgc	ttccttgctt	tcaagtittc	attatcttat	aaggaagaga	39420
acgttatggtc	tcttgaaaaa	actgacaata	agaagtaaca	actggaactac	cacatttttt	39480
tttacctcct	taatttaact	cttcgtcaat	ttcttttttt	acttaaggag	gacgaatcca	39540
tgaaaccaacc	aggaccaact	aaaaccagac	tggctattag	tcagtcacat	ttaatgactg	39600
caacttggtca	cacaagaacca	tccatttagt	aaagtactag	gaagaatttt	gctgagctgt	39660
aaagtaacaga	ttctgttttg	gaagtacacg	tactattaca	agtgacattg	tattacactt	39720
aaaactcttaa	agtgctgtgt	taaaataaaa	atatttttga	tattttaaag	ctaattcaaa	39780
aaatatgtgt	cgtagctatg	cattaaaaaa	cccaaaaatg	tcagaagtac	agaagtccaa	39840
attgagtttt	cattacaacc	ttcat ttgt	tatatctgaa	ttatctcata	tggactcatt	39900
taatttttagt	aaacttgggc	tgggtgctgt	ggctcatctg	tgtaattccca	gtctcttggg	39960
aggcccaagg	aggtggatca	cctgaggtca	ggagttcgag	gcaagcctaa	ccaacaacgg	40020
gaacccccat	ctctactaaa	aatacaaaaa	ttagccaggt	gtgggtcgat	gtgctctgat	40080
tcccagctac	ttggggaggtc	gagacaggag	aaattgcttg	accacaggag	tgagaggtgc	40140
agtgacccga	ctgtgcacca	ctgcactcca	tccagctctg	gccacagctg	gacgaactga	40200
ctcaaaaaaa	aaaaaaaata	atttagtaac	ttcgaagaaa	taagaaggaa	aattaaaagt	40260
tgaaaagtgt	tctaattgat	agtttataaa	attttgttat	aaaaataacc	gttttgcttt	40320
caaaaataatt	tatatataat	ttttattgac	ctcaagaaca	tttaaaatac	ttcagattta	40380
ttcatctgtg	gaccacattt	gttatacatt	ggattttaa	gatccctgca	attgatttta	40440
tggccacctt	tgcactctg	accatggac	tgggaaccaa	tctaggtcaa	tgatctagtt	40500
tgattcaatt	taagagatgt	ttattcctgg	tctttagaag	ctgctacatt	ttgttatcta	40560
attttgcagt	actttgaagt	atgtatgtat	gtgtacatac	gttagtgcta	tgtattttat	40620
aaagaagaat	cagaaaaacag	aggttaaggaa	aaataaggaa	acaaatttct	gttaaagcca	40680
ccacctccca	aagcatattt	gtttatatgc	ttatatatgt	tttccattta	tggttaagaac	40740
agtcctgtaca	tattgtctta	tagcagtcac	cctttatcca	catacatctc	gaaaaattgt	40800
ttacatttta	aattgttaact	actttattgt	ttttaaatgt	catttttatg	tgtagctatg	40860
ccacaattatc	acattttttag	acattttaa	tgtctccagc	caatgttgta	atgaacattc	40920
ttgacagctga	atatatgcac	atatctaatt	gtttcacctag	gatagaggtg	gaattgtata	40980
acaggagagct	caactttttt	aaggcttttg	aaatgtattg	ccaaattgcc	tgttgactgg	41040
actgcacact	cactacaact	gtgtgttgca	gtattttttc	aaacttggcc	tttttgattt	41100
tagaaaaaatg	atatcataaa	tttaccattt	tttgattaaa	gtgtagaattc	caattttttt	41160
catatttattc	atgtgtctat	gtattttatc	ttttctaaat	tgctctctta	tcccttttgc	41220
tccggttttct	attggagctgc	aaactttatt	gttaagaattc	tttttaattc	ctgtgactgg	41280
aaatttttttt	tctagtttgt	tatttccctg	tcattttcta	aaataataat	gtgtttgcca	41340
acaattccatt	actttttttt	ttgtaatggt	agttatttata	catataataat	tatctctttc	41400
ttttttcaga	ttaagaagct	ttcaaaatcc	aaaggaggaa	aaaaattcaa	gttgaaacat	41460
gtttgcagct	ggacagaag	taacttttag	ataaaatata	cttcttttgt	attttgtttc	41520
gttaaagttt	ttgatggctt	ttccatattg	tgtaacagga	aaaaaatgtg	gtctatgat	41580
ttctctcttaa	ttcaacaact	ttggttaatt	tataaaatca	caagtggta	tatgactata	41640
tttatgtaatg	atcaggtatg	agattaatac	tgtagtataa	attgggacat	tatgacagat	41700
tccattatttt	atttccctaa	actcaaatc	agtcctttaa	gaataataat	tatgcaaatg	41760
gtggaactcaa	tttattttct	ttgagggaaa	gataataaag	aatgtaataa	aattttaaat	41820
ttttggaatt	cccagttgta	tattcatcac	cttttgagca	ttgtacaaat	tattctgtcta	41880
gcagctctct	caactgttttg	aaataaaaaa	tccattatcc	tactgataca	attatcttgt	41940
ctttgttatat	caaaaaatgt	gaaatttaca	cataattcaa	atcatcttaa	tattccgtct	42000
aaccagaaat	gaaatcacat	ccctctacta	tactacatcc	agctccaagc	ccaagtataat	42060
taaatgacat	ctatttctct	cctagttcca	gttatgtatt	tatcttgata	ttctctcata	42120
tatgaactcaa	catataaact	tagccaccat	caatacaatc	tgcgtatcta	atactctaac	42180
tatatagttaa	tggggtaagg	gaacagcaaa	aaggagagaa	ttaattaaaa	tatacaagta	42240

agcctgggca acatagtggg accccatctc ttaaaaaaaa aattagccat gcatgatggt 42300
 atgcctcttag tcccagctac ttggggaggct gaggtaggag gatcacttgc tcccaggagg 42360
 ttcaagggttc taaccagca aagctcagaa tcccaggga tagaacaaca gacttagtgg 42420
 atccactagta ttaacttgag acacgtcacc ctgcattgca cttgtttctt cagttcttgg 42480
 atgaaatcac tgaactgaca tacctgccct cttttcacca taaagttagt ttcatgatca 42540
 gaagcaatgt ctatgggata gcctaaacaa caatgtaaaa accatttagt aagtctcatga 42600
 aggggtgggtg tggtaaaaaat ttggagaaca tacaaaaaca atacaattcc aagggtgtgc 42660
 ccctccagga aggcaaaatt gctgcctgct ctgtgataga agaggatcag atgtaaatcaa 42720
 cctgcgtca gacttgggct gtctctcctt gggtgtggac ttgcctgtgtg gctcactgct 42780
 gctgacaagt aggtctgtcaa tatagctggg ttgtcatgtc agctgtgtgtg agggggaagt 42840
 ccacattgtg gaggccacat ccctgcactc ttggccaatt tgaccatgaa tcttaagcac 42900
 ttgggtggct ggaataagaca gccgattgac atccatacac aggtcatctt gaccacttga 42960
 ttagtataag cactgaaggc ttttaactga ccatccacat aggcacacaa tatctgatt 43020
 ctttggggccc attccaagaa ctctggggcat acttttctct cagacctcat acccagttgt 43080
 tagtataaag cactgaaggc ttttaactga ccatccacat aggcacacaa tatctgatt 43140
 agatttttat atcagacatc tctacctcct gacagatgag aggagatag ttaacttaaca 43200
 attctgttcc cttggaagt ttctgtctc cactgtttgt aagggtcact ccctcaatgt 43260
 agcagtaagt ttttcaactg gatgggaagt cacagtggaa tctgtgtgt ccaagaatta 43320
 gtgtttatgc atcacagtg tctgataatc cccagagtgt ctggtgcctt ggactctgtg 43380
 gaagaaggct tggagaaaat aagattcatg gcaagaactt gtgtgtgat tgacgggctt 43440
 ttctctggc ttctctatct tagtctgacc taggtgtgag aattagggtca ggggcccattga 43500
 ctatattgtg gtgaactcaa ccaggccttt gtttactaac tggggagattt ttacattgta 43560
 agaatacaat aggatatttt cccatgtatt ttgtgtttaa gaacacaaat gatattgctc 43620
 caatgtctgg aggaacaccaa gggctcttgg tctcacgtgt atttagatgaa aacagctgtc 43680
 aggcctctga gcccaagcta agccatccct cctgtgacc tgcacgtata cctccagatt 43740
 gcctgaagt accaaaagca cacaaaagca cctgttctgt ccttaactga 43800
 tgacattcca ccatgtgtat ttgttctctg cccatcttaa ctgagcgatt aaccttttga 43860
 aattccctct aattgtctca aacctccccc actgagcacc ttgtgacccc gcaccttctg 43920
 cctaaagaaa aacctccctt gattataatt ttccactacc caccacaaat ctataaaaat 43980
 gcccccacc ttctctcctt cgtgactcc tttttcggac tcagcccgcc ctgacccagg 44040
 tgaataaac agccttgttg ctacacacaa gcctgtttgg ttgactctct tcacacggac 44100

<210> 64
 <211> 16869
 <212> ADN
 <213> Homo sapiens

<400> 64
 aagctttagt agagactctc aaaaatgttg gatggtagca aattactaag aactctcaaa 60
 gtttctaaag ccttagtttc agcttgcctag aaaacctatg ttgagtattt tggctagtgc 120
 catagttgag ttgggaattg tctttgagga gacacttttt cactttgtat tcatctgtac 180
 atttttctgt acttgatttc tgcattgctc aggcattatg agcaggtaca tttttataac 240
 tggaaatgtt atgtgtatgt aagctctgag aggaactttg attgactctc agcagcataa 300
 tcagaaggtt gtctctttgt tcagcaattt ttaagctaat agtagcagaa attgcagtgg 360
 aaatagactg ctttgccaca acattcagaa atcattttat cttttttttg cagttcttgg 420
 caccacacaa tacatttttag tacttctcaa attgcagaac tctcataggg ctgggaaaaat 480
 gccctgagac atacatatac tatgaatgtg ctaagtgttt ttgtattttt atagcccatc 540
 aaagctcctg agtcagtgtt cactataatc actgcagaat caatcttcta caaggtgaagc 600
 tttttgagag ttactgtagg aagagttggg cctagttggg ttactgtccc taaaatgttg 660
 gattagctta aaggtctctg ctactcttta ttgttataag gtgtgattat actttttgtg 720
 ccctttactg ctgtttttccc ccaaatgttg ctgtttat taa acactctcat cagttctgtg 780
 agtggtggag gaaagtgcct actgacacat gatgtgagga tcttaagtatt ttttttttag 840
 tgtatagttt aggaattatt cttaaaaatg tgaattgata gtgtggagcc atggaagact 900
 gagccgttat tgcgattgga ttgaagaatg agaaggacag agacaggatt tggactagta 960
 gaggtttgtg agctgtgtgt caaatgggtg gagtagggcc agagattcta aaatgccttt 1020
 aagttggagt gagctgagta agggcagtag cactctagat caactcatag aaactcatg 1080
 tgagaggagt tccaagatgt ttgtataaaa gaatgaggag gtcaggtttc ccaggggcca 1140

atctcatgaa	cactgtgtac	ctcagttaga	gagctgac	atgttgtgtg	ctaaaccga	1200
agctcttgaa	aaggaattag	aacatgaga	cccaagctc	ggcagctgt	gcacggcga	1260
ggcagcaaac	attgaagcct	atttgcagct	tcgggactg	agctgtcatt	taggggacg	1320
tggttgtagt	tagtacttta	tgtgtgacc	aggtggactg	agaaactcaa	gtgatgatg	1380
ctcttaagat	acttttttt	aagccacaa	tcctatatgt	cgaaagtctg	tcctcccaac	1440
aggggtacac	tggtcattct	cagcaggctc	ggggaaaacc	acacacaaaa	aaagtctcta	1500
cacaggcaca	ctactctctt	atctttccaa	catctaatac	atttgttaata	aaatatctga	1560
agttttacaa	actgtgtgtg	tgtactcagt	gctgtgacct	tgtgactgtt	tatttctact	1620
agtcctacat	atgaggtgtg	tactactact	cccatcttct	agatgagAAC	atttagggac	1680
acgcagatct	atctaactgt	ccaaagctac	atagcccaat	agctcatggc	tggaggcagt	1740
tcattgcaga	tgcttaagct	agagactagt	tcctggctct	acgtctttag	caagtgcagt	1800
gctatgtgac	gaggaccac	ctctctaatg	tcctcatctg	aaaaatagaa	tgttaaatag	1860
ttaactacac	agtggtgtca	atgaaactct	atttgttaag	catctagcac	agtaagcac	1920
caatgaatat	taggagttat	cacactctcg	tatttgtgca	ttaaccttca	tgatttaaga	1980
ttaaggccag	aagcaactgt	tgtagctacg	gggttagtgt	actactagac	tccatgtgtg	2040
ctctccatgc	aggggtgtg	ggactctgta	tgttgactct	ctgtactctt	gtaattgtgt	2100
ttgcacacca	tgtttattaa	atgataagaa	caataatgca	acaaagtagt	caagttagtt	2160
tgcgaatgcc	cagtatattc	tggcctatca	cagcagtgcc	actgggcagg	agaccattgt	2220
tgccaaatgc	aagaggtcac	ctgcagccac	tgagctagag	ccagatgag	gcatgcaga	2280
ggagcctagt	tgggagccac	tggggactac	ggccaaagat	gacacaccc	aagaccacga	2340
attggtcagt	ggcctccctg	gagcatggca	tgccgcgaac	aatccatgac	actcagatct	2400
gtgtgatcgt	aaactagtgc	tgttctctgt	tggaccctct	tcctctacca	gaaaccttga	2460
atctctccct	caaatgagga	gactactcag	atcagtgact	tagtctcgtt	tggtgtttta	2520
tatgttgtca	caacacagca	catatttaata	aaatacctact	atgtgccagg	cactgctcac	2580
cactgtgaac	tttctaactg	acattgtttt	tactttgcatt	tcgtctcgtt	acactaatga	2640
atgtagtctt	tgttgattcat	attactactt	catacatttg	aaatgtcgtg	gttatgcata	2700
tgaagctctt	gataagcaag	tattctcatt	tagaatttgg	gaattatgag	tatacagctg	2760
gagaaacaaa	catataattg	aaactattta	taqtataaat	aacatttggc	tggtgctcgt	2820
gaggaagacg	cagctaatga	tgggttagaa	ctagcaagta	gcggcagtag	gcctgcagta	2880
cccgacacca	tcctgtagtga	tcctagatgaa	acagcacccc	tcagacacat	ggataaagct	2940
ccccacagga	aaaaactcct	ggcctatgaa	tgctgatgtt	acagtctcag	tactggaagt	3000
atttctccaa	aaagtgtttt	atggttgagg	tacacatttc	ccagctctta	cctgtctgca	3060
agctccctgt	tcagaaggaa	cagcaattgt	ttaacactgt	ccgtagctta	aggaacatga	3120
atcttaccaa	cacttaatacc	cacttaatacc	ggtgctgtag	gtctataaga	tttggatcaa	3180
ccattatggg	tgttcagagg	agagattagt	tcacagtcaa	agccaggaga	agaggacata	3240
ggatggatgc	cagagtctata	ggggagattt	aacacaggac	atgtcacacat	tagtttagtt	3300
ggtataaagt	ggaaacagaa	tgaatgagac	ccaaagcctt	gaatggcaga	aaataactaga	3360
gtctcctgtt	ggaagagatc	aaaactcagg	tcggagtgga	agaagaagcg	acgagtgtgt	3420
cttaggagat	tacagttagt	tggatgaaac	atatccgtga	gactataatc	caagaattat	3480
ttttgtgtgt	aaattgtttt	gggttgaatt	catgttgata	attttctttg	aaagtgttgt	3540
tgggagaggt	ggcatgtaga	atgcattctt	accaaactag	catgtctatt	aagacagatc	3600
ggagaaagac	ctgtgagtct	gatgtgactg	ctttggctgc	agctctctat	gccttcagca	3660
acgcgctttt	cccttaactg	gctctcagac	tgtggctaac	aaagttaggga	tagtaccagg	3720
cagcagagat	tttttagggc	gtgaaactat	taactacttc	tttgtatgat	actataatgt	3780
tggtgatcat	tcattataca	ttttgccaac	ccacaggaat	acacagcac	agagtgaac	3840
ccctaattga	actcgtgtct	tgtatgatgc	tctgtcaagt	tacgtctatc	cgtagtaacc	3900
ctgtaccact	ctagtgtgtg	gaggggtgtg	tgtataatga	ggagagatgt	catgtgtggc	3960
ggcaggaagt	atatgggaaa	tcctcttact	tcctctcaat	tttgcgtgat	acctaaagcc	4020
ctctgtaaaa	ataaagtcta	tttttttaaa	agggggagat	gtatcacgcg	aatataaaa	4080
caaaataact	tataaacaca	ctttttctcc	tatgtgtaac	tgctatatac	gcacctcgtt	4140
atgtgtatgt	ataattttca	tcaccaaacct	aaacacactt	agaaattgca	ccaaacatat	4200
aaaactagat	acatttagact	ctcttcgaac	tcctttaact	accactttgc	aaaactgctt	4260
accttaatag	gttccattcat	agcgtgtgct	tgtctatttt	attttcttgc	tggtgatcat	4320
ttctgtttcc	cccgaggtat	atattaccaa	atttgtgatg	tttgttctgt	gattgtgcag	4380
caagatggaa	agccctacta	tgtcctaact	agaggtttta	tcccaggaca	caatttgcag	4440
aagatgctgc	cactgacgtg	gctcactctt	acctctctta	tcccacagca	ccaatttgat	4500
ccgcctccct	atacatgag	taagtttgac	taagtggaca	ggttttttgc	taacttagt	4560
aactctcc						

cacagactga gtggcttaaa caacagaaag tcactttctc acagtgtgtg aggcgtgaagt 4680
 ccaacatacaa ggtgctgtgca acacggagttc ctggggaggc ttttcttctc gccatataga 4740
 tgggtcacctt ctgctgtgtg cctcacatgg cctttcatgg agtgagagct cttgggtga 4800
 tctcttataa agggacacat tctgtcaga tgaggggccc acccttatgg ttctatttaa 4860
 ccttaattgc cctcctaag gtcctatctc caagtacat cacattgggg attagggtctt 4920
 caacataata atttgagggg tggcgggggg ggatgcaatt cagtcacataa ccaaaaaagc 4980
 atgagtatta ttaagtacaa aaaaattaga gagctttata gaaaatatga gaaattttat 5040
 gtgactggag tgtgagtgct atcagttatt ttgagttaga gcaatgtgca tctactaaga 5100
 agtggctatg ataagatttt ttggagtgga cccaggggta aactgtaata caaagattga 5160
 ttgctcagga actaggttat ttaggttact tartaataa aacctattca aaaaataatt 5220
 aggaaaagac tatccaggt atccataact tgcaaatctt caatatgtgt gccctctgcat 5280
 gctacacatg tcatcttagg cctttatagt ataaaggctg atagttgaaa tggcagctgt 5340
 tgtgcttttg ttaatttcaa agctgccaaa acagttgtga gatagactca caaagattta 5400
 ctgatttaata caatttttaa agtttcaga ttttlacagt tacttcagac ttttatcttt 5460
 tctgcagtag gcatgcatca ttacttttgc atcctgagaa caagcataag tgtgtttttt 5520
 gagagaactc cagggacaaa taatatacca ctgtttctct tttlacagt tacttcagac ttttatcttt 5580
 tacattacca acaaatctga gcccttctgt tataagtata tagaattttt atttacctta 5640
 tctatggatc aggatctcag caggagcgct gatgtatcag aatcaccttc gggattctctc 5700
 tactgcctcc tctttctaact cccagatct tgatattgcat cctgttctca caggcagga 5760
 gcatggcatg aggtcagaac accagttctg gagccagact gctatgggtt cagacgtgcc 5820
 attttacggc catgtgact ttggcaagtt cttagtctct ctgctctcac ttctctcata 5880
 tgtataattg gaataataat agtgcttacc tcagaaggtt gatgtgaga atgaaggtat 5940
 tgatacatgt aaacttagag cagtgtgggt acaaaaataa catgatgcga gtgtcaact 6000
 ctgatttttt ggagaatgcc atattcttta agccgttaaa gaagaaaaaa gattataaga 6060
 taattttcaa gtaattgcat ttccaagggc taatgccagg ttgctccagc agtggctctt 6120
 cccagttctt agaaatttta acatcttatg aaaaatgat atatggtcaa aaatgtattt 6180
 aacctttccc ttgctgcct tccagggcca gaggaagatc ttccaaggaa gatggaaact 6240
 ctgttttttt ttgtctatgc accctctgag tatttcaagt cagcgtcatc accatttccc 6300
 acagttccca ccagaccaga gaagggtac atatggact atgttgggcc tactcctgca 6360
 ataacaatta aggaatcagt tgccaaacct ttgtagtcca caaattaaaa ctgggtttcc 6420
 aggcctgggt tgggtgctca cgcctgtagc cccagctatt gcaacctgct tctccaagct 6480
 gggcaatgga gtcagattct cttctttaa aaaccacaaa aaaactggat tccagttct 6540
 ctaattattct tagtaccaca agatatgtca taggtatctt taaatgaaat tcttatgttg 6600
 aaaaagtact aaaaagtttt tctcctgcta cctagttaata acaaatcat tctttattac 6660
 tggctcactta gaaaaataaa agggataggc ccaggcacag tggcttatgc tctgtaattg 6720
 agcactttta gagccggagg caggcggaac acctgaggtc ggggaagtga tcgctgagg 6780
 tcaggagttc gagaccagcc tggccaacct ggccgaaccc cgtcgtact aaaaaataa 6840
 aaaattgcca ggtgtgggtg catgtgacct taatcccgag ttttgggag gctgaggagc 6900
 gagaattgcc taaaccggg aggtggaggt ttgagtgagc caagattgca cccgtgtgct 6960
 ccagcctggc caacagagtg agactcttgt ctggaaaaaa aaaaaaaa caaaaggctg 7020
 ggccacagtg ctacgcctt taatccagc actttgggag gctgaggcag atggaatgct 7080
 tgaggttggg agttcgagac cagcctggcc agcatggtga aaacctgtct ctactaaaaa 7140
 tacaataatt ttggtgaaac ccaggaggcg gaggttgagc tgagcagaga tctgtccaat 7200
 ggcacagagaa ttgggtggaac agagcaagac agaaacaaa aaaaaattaa 7260
 aagggtatga atataatgaa atatatattt aacttaaat atattctata tgtttattct 7320
 cctaggcaaa agctgttaatt tccagagaga cacttaggaa caggtagtat ctatttttct 7380
 ccatatttta ttcttgaaa ctcatataat ggattgtatt ttctataag acaaaaatt 7440
 taattagggt atagtgact gaccaaggcc ttaatacaaat aaaaatgagc acagactata 7500
 ctataaagcc acacaagcct tatgtttctca tctcaaaaat gctgtgacag ctttttggct 7560
 gcttttaacca taagaaaaat gattggtgga tgatttttatt agcccgagct tttaaaact 7620
 ttctatctagg ccaactggcg ttgctcatgc ctgtaattccc ggcaacttgg gagcctgag 7680
 tggatgtgat ccttgaggtc aggaattcag gactagctgc gcaacatgtg tgaaccctg 7740
 tctctactaa atgatacaaaa attagttggg tgttatgggt catgcctgta atccagctga 7800
 ctggggagcc tgagggcaga gaattgctgt aactcgggag tggagaggtg catgaagcc 7860
 agatcgtgcc actgcactcc agcctgggtg atagagcaag actgtctcaa aaaaagaaa 7920
 aaaaaaaaaa ttttaattta atccttctgt agaaacagc attcagaacc attcattga 7980
 tcttaataaa gctgctcttt actgtttcta gtcaaaaatg agacttcgat caaacccata 8040

gattttatcac tgcagatagtc cagcttcacc aaagccgcag agggaaacatg tcgagatcag 8160
 gcttccctgt tgcattgtctc ttgactacca ttaaaacgaa tatctggagg tcactgaaagt 8220
 cactgtttagc ccattagcat tgatatcttt aaacacatcta ccttaaaacca tctgtctagg 8280
 acccataata agaggccctgt tgatatagaa attgtctaga attcagggtgc aggtcttttgc 8340
 cggttaagta agggagcaac acgtaaaaat ggagaggagt ggggtgtaact cacttgccctc 8400
 ctctttttgtc ctgattttaac cagcattttt caacctctggg aaaaatttgca gaacttaagt 8460
 tgaattgtaat gattttgagc tgcagcagct ttaaccttta cccctttttcc acatagttat 8520
 ggtgttttagt ttggaagaaa caaactatag gtatgtcacac gtacataaatt atctctttat 8580
 tcacaaaagg tatatgtaaaa ttgattgtaa ataactttct aagtgcoaat ttccaaaact 8640
 ttggattaaa aatgtattttt tcaccgtgca tttactttgg atgtatttat ttccatttaa 8700
 caatttaaat ggggtctcttt aacaaaaaat ggtattttaa accaaaacag ttgcgaactt 8760
 agaattttgga gttagaggccg ggcacagctgg ctacgcctgt taatcccagc accttggaag 8820
 gctgaggcag gcggtacacc tgagggtcagg agttcgagac cagcctggctc aacatgaaac 8880
 cccgtctcta ctaaaaat acaaaattagc tggcgctggt ggcgtgcgcc tataatccca 8940
 gctagtctac tcgggagggt gaggcaggag aatcgctgga actcaggagg cagagactgc 9000
 agtgagccga gatcgcccca ctgcactcca gtctgggtga cggtatgact ccatctccaa 9060
 aaaaaaaaaa aaaaagatttt ggagtagatt catcataat aagtaacaga ttttaggaaa 9120
 atcaaaaaat ggctataaaa atgaacacaa tttaaaacat ttattaaaaat gttagactttt 9180
 aaaaaatctat aaattgtatca tctgtttata aattggcaga tggtttttgc cactctttta 9240
 aaataaagat tgaatttccc ccagttgtat ggttccattt gcttatattt cctcctgtga 9300
 ggccggagcct gatctggacc tggctgtgtt tccagcctct gtttctcatc taacctaaaa 9360
 atctttcccc tgtatgtccgc cccaattttt ctggctctga gtctctgttc atactgtct 9420
 ctccaattct acccttccaaa ggctcttctt aacacctctg gattctttct ttgagaactt 9480
 tccagattcc catgccccttt tggaaatcaat ctctatctta ttgtcatcac atttaagttt 9540
 ctacttccat cactctcaact cctatccctt tggctctggg atgacaggga tgcgtgttt 9600
 tattttactca tcttttgtaac ttccacataa cctaaccccg gtctctgtct atgggagatg 9660
 tgaattgtag ggtctgagtt agataactgtt aactaaaaat ctgtgtgata ttttagttat 9720
 caattccat taaactttggc tgaacttttt aaattctatt gtgaatagtc aagtaaaatt 9780
 tagattttagt cactctgggt tagtattaga ttgtttttta gatgttttta aacaagatgt 9840
 ttttaagat agtttttaatt agttctctta acacaaaata agcttaatat gagtatttga 9900
 aggaattat cccaaaacct tccagttctct ggctgtgaaa ggcttttcca ggctcaataa 9960
 gtttccact tcagccgttaa gtagggtgaaa tcaaatgaa acatagaggga aatgatttta 10020
 ttttctttat acacatgcatt gtgtgtgtgt tctacatata aacattgcac acgcttagaa 10080
 tgaattttct gtcattgccc gaaaaggagg aggcattttt ttggaatttt gtggctgcc 10140
 ctggggatgt ttgaagaact gtgctgttta ctccatacca ggtgtgtgag ccataccttt 10200
 ggttagggagg tatacctct acacccaaga aatataagcc aggagaaagt tctgccaag 10260
 agaaaggaac caaatgacc caaagaggtg ggccattaat tattgggtca gatgcataaa 10320
 tgcacagtaa tttatttaag cactctttaa tggtagccca caaggaagt gtgctgtagt 10380
 aggggaaagg ttccacataa ataagagaaa aaagcagaat gtgaaactgt atgatagcaa 10440
 tcttgcacac aagaagcatc ttttataaaa gatggaagga gccacggcac agtagctaat 10500
 gctgttaat ccagcacttt aagaggctga ggtgaggagt cacttgagct gcagtgaccc 10560
 accattgtgc caccactcca gctctgggtga tagaagttag accctctctc aaaaataaaa 10620
 aaaaaaaa aaagacggaa attcctccag aatttttaaca tgtcaacaga gggtttctgc 10680
 agctactttt ttccagcttta tacttgcag tattttccaa attttctcta acaagacga 10740
 ttttccaaat tttttacaat aagcacacac acacacacac gtttgtttgc ataatggccc 10800
 aactgggtgt gaacaaocgc tggcttttag tctatacata tctagaatat tttataaat 10860
 gtatgttcta aacccttgaa agggagttaa tgaccagctg agaaaaataa gtacgatt 10920
 tcatattttt cctattttca catcatgat cttaggagat acttggaagt cactctctc 10980
 agctctcagc actcctgggc caggcgcagt cttagctctg tggtaaaagt caccagcttc 11040
 ttctcagagg tgcctgtatc atctgaattg gagggtttgc gagggttaaga gactctgga 11100
 gtttcaagtt ttcttttctc gtctccact tgaattctgt ctctccctcc agactcgtct 11160
 cgctctgcac ttaaggccccc aacacccaaa acagaagcaa cagccttaca cagagtgtc 11220
 acaagctcc acaaattgtt taaggtaaa ttctctttat agattctctt tctatatgc 11280
 tctagtgggt tctgtttctc tgaatcgaatt ctggctgata acagtgtctg agactctgag 11340
 aggaagacca aggaactagt gtctctcatt ataaacttgt tagaatttat tggccacttt 11400
 ttgtctatga atatagtagt ctttgataca ttttttaatt caaaaagtaa tgaaagacat 11460
 cacataggga aagatagatt ggaatttttt taaagtttat atactaaatt gaaaagcaaa 11520
 gaataaaatg ggagaaacag ctccctcatg tggctgttgg caggaagctt ccatctctct 11580

ctgtggggcct ccacaggttt gctcacagca aatggtccgt gacagaaaag cgcaagggca 11640
 gttgcaccaca agatggaagc caccatcttt tctataacct aatctgaaaag aagggaacata 11700
 ccagcacttc tgcacatagc tgttgggtca cacagagccaa ctctggtaca gtgtgaacac 11760
 agggccaccac aaggcgctga attccaaagg cagagaccac tagggaccac ctcagaggca 11820
 cagaggggaca cccatccag ctggtggcca atgtaaaata acatagcttt ttagaatagc 11880
 aatatgtata tataattcta aaagtattaa aagtacctct tgatccagta atttcaattc 11940
 taagaatcca tgcacaaggg atttaaaatg tggaccaaaa aatgggtata aaaaagaagt 12000
 gtttaacagta tttaaaattg tgaaaaacca gaaacaactc aaaggtccaa caataggaaa 12060
 atgaaatttg ttctgatttt aatagaattt tatgctgtca tcagaaatac taacataaaa 12120
 taatttttaa taacgcaaaa aaaagtttat aaaagtgtta gtgtaaaacc tggcacacaac 12180
 tacataatga ttctgtattt gtaaaaaaaa aaaaacaaaa cacacacata tacatacaga 12240
 tacatatgca tataaagaaa actggaacaa acaaaataac aagcatagtt ggaattacag 12300
 tcattttaat attcttttat ctttaaaaaa ttttgaagtt tgtattacta gcateccata 12360
 ctacgtagtt caggaaaaaa atacaacttt aaastagata tttaggtcca aagatggtaa 12420
 tctaattggt gttacaggtc gaatgtgtgc ctgatcccca tgcaccaagt tcatatgta 12480
 aagccctggc ccccaaggca atggtattag gggagtaggg cctttgggag gtaatcagat 12540
 ttctacgagg tcatgaggtt ggagcccgca tagtgaattt agtgccttt taggaagagg 12600
 agaacagacg aaagcctctc ttctctctct cactatgtaa gaagcagccg agaaggtggc 12660
 cacagccagg aagagagctc tcaccagaac ccaaatctgc tagcactctg ctctgggtgt 12720
 ctccagctatc agaatctgta gaaatgaatt tgtgtgtttt aaaccactca ggcctacgta 12780
 tttttgtgca gcgcaccaac ctgacagaga tagaaaaaac caaaggacc cctgacgagc 12840
 gaagtggatga tcaaaacgct gtgaggtcgt gcagtgggat attattcagc cgtagaagac 12900
 atgaaattct gatacatgtc ataattagta acccttgaaa catgttaagt gaattagacc 12960
 aaacttaaaa ggacaaatat tgtataattc cacttataag agttagttac ctagaatagg 13020
 caaattatgt catagataca gaacattaga ggttaccagg gtgtgggaa ggggggtatt 13080
 gtgggtacaa attctgtctt tggagtgaat ttgaaaaaat tctggaaatt gtagtgtaca 13140
 ctgagtcaaca tgaatgaatt acttaagtac actaaattgt acacttaaaa atgtgttaata 13200
 ctgggtctggc cagctggctc atggctgtaa atcccgagaac ttggggaggc caagcacaggc 13260
 ggatcatgag gtcaggagat tgagaccatt ctggcttaaca tgggtgaacc ctgctctcac 13320
 taiaaaaaaa aaacaaataa aaaaaaaatt agccgggcat ggtggcaggc accctgtagtc 13380
 ccagctactc gggaggtctg ggcaggagaa tgggtgtgacc tggggagtcgg agctctcagtc 13440
 gagctgagat cgcgccactg cactccagcc tgggcaacag agccagattc cgtctcaaaa 13500
 aaaaaaaaaa aaaggttgat acctgggtgc ggtggctcat gccttgaatt tcagcacttt 13560
 gggagggccaa ggcaggcaga tcagttgagg tcaagagtta aggacagacc tggccaaact 13620
 ggcgaiaacc catctctatt aaaaatacaa aaattagtcg agtgtggtgg tgggtgcctg 13680
 tagtcccagg tgcctggagg atgaggccta ggaattgctt gaaccagaga ggcagaggtt 13740
 cgagttagtt gagattgcgc cactgcactc cagcctgggg gatcattatt ttaccataat 13800
 caaaaaaaag gttaaaattg taagttttgt tatgcatttt ttacataatt ctttaaaaaa 13860
 tagatatata ggagataaag tcaacagaat ttaataacca gttgtaataa gagactgagt 13920
 gagggagtag aattaaaggaa gacatttgat acaacttttt ggtagtgtaa aaactcttaa 13980
 aaaaaactgt gggcaaaagt cctacttgat tcttataatt taaaaactct cagatttaga 14040
 acaacagcta ggtggagatt tgcattgtag gtgaggtgtg tttttgtttt tgtaaagtga 14100
 ggaactgtgag caactctcctg gacttgaata tccattagat aattgaaaaat acggaattga 14160
 gaactcagga cagctgcacat gcagtaacaa aactctgcac ctagtgtgatt tctgtcctct 14220
 aatttaactg ttttatggga caaactgtta ggcaggtggg caagatggac agccatattt 14280
 ttgtgtgttt tggccctgtg ggcagcctc agtgcctcact ctgaggtcat gtcocaaact 14340
 agaacacatt caggcctacc acagtcaagg ctccctttct caactctagt cctctgcaac 14400
 aatatccgaa ccttagaata aataatcact gctctgtgtg tgtctgataa tgaagagcta 14460
 ggaagaggcc ttgggaattg agaagaattg aaaaactggt ctaactgctg catgcttccg 14520
 ctgcaggggc attcaactgaa atggggacag gccataaaag gacaaccaga agagtggcgt 14580
 cagcaaaagg catgtttttt agagcaagct agaaaactct gccagcgtcc taggcagcag 14640
 cccctgggca cagaggttag gcaagggtgt gtcccagcat gttgtgccc tgaactagag 14700
 aataatgccca tagagagact tccaaagagt tcatatttgg tttgtgaagc cgaactattc 14760
 taggcataaa aaatttgatt ttgtgaataa agctgtgttt tcaactccca gtgcagattc 14820
 tcatagattg atagtggctt gtgatccaga taaagaaaac aatttttcaa atgcattatc 14880
 cttttagatt tgtacgagtt tagagacatt cctcctcatt tccatagatt 14940
 aaaaaatgagg cctaaggagc ttaagaaaat accatggaaa tgtcactgct gaactgccat 15000
 acgtaggatc cgaaagaaat tgggtaaatg tactctgtgag aaatacagta ctaggtccaa 15060

agaatctaat acaaatataa aatctaaatg ttatttctaa agcatccctg cacatggctg 15120
aacttaacata gtttctatttt ctttctttttc tggggaagaa gaggcaattg gctgggtgca 15180
gtggctcatg cctgttaatcc tggcactttg agagggccag gcggggtggat cacttgagggt 15240
caggagtttg agaccagctt ggccaacatg gtgaaacccc atctctacta aaaaatacaaa 15300
aattagctgg ctgtgtgtggc cgtgtccctgt aatccagctt actccagagg ctgaggcgagg 15360
agaattactt gaatctggga ggtggagggtt gcagttagcc aagatcacgc cattgcactt 15420
tagctgggat caatctggaggg aaactccatc tcaaaaaaaa aaagaaaaaa agcaatcact 15480
aaactgtgtt gtttattaaa catgacagac tgccatgaag taattaccaaa actgtaaaaa 15540
aaaaagctac aaactctggag gcatggtggc tcatgctgtt aatccccac actcggaggcg 15600
cagggtgggg gatccactga ggcctggagt tcaagactag cctgtgtcaac atgtgtgaaa 15660
ctcgtctctt ctaaaaaaac aaaaartagc ccgctgtgtt ggcacacccc cgtgtctcaaa 15720
gttactcagg aggtctgaggg agggagatac cttgaaacct ggcatgtggg aggtgtcagt 15780
gagccaaagt cgcaccgttg tactccagtc tgggcccaga gagttagact cgtgtctcaaa 15840
aaaaaagaaa aagaaaaagct acaaccttaa tctcaacttc tcaatacaac atctctactt 15900
ctgattagaa gagtggaggt ggggaggttt attcaaaaa gactgttata ccttacacac 15960
ttctcccatc gaatagttaa ggtgtgagtg aaaaagacag caattttatt ttttttttga 16020
aacaggttct tgcactgtca cccgggcttg agtgcaactg tgtgatcact gctcatccca 16080
gcctccactc cccaggctca agtgatcctc ctactcagc ctctctgagta gctggggacca 16140
cagttgtgca ctaccatgcc cagctatttt tttttaagag atgggggtctc actatattgc 16200
tagggcagtg tctcaaaactc ctggcctcaa gcagtcctcc gactctggcc tcccaagggg 16260
ttgtgattac aggcataagc caccacccc agccagcagt tttagaataa aggggtgaagg 16320
gtgctgtggg gaaataataa tcaaaaaaca aaactctctc tcaaccacaga aatcctctcc 16380
atgaaggcag tagagaataa taagctttat tattgaataa aaattaaatg agcaatgtgat 16440
gcacatcacca ggcaacttgc taagagatca caaagacaga aggaatttcc accattttgt 16500
acagccaaag aggtacaggc cattacatgt atgttttcga gaaataatgt cctcaactaa 16560
gagaacttga cagcaccact ggtcacacag ttcattctaa tcttacctga taattgtatg 16620
gaccaactgt gttattcaag atatacaatt ttcgggggtg ggggagttgt gaacacaggag 16680
tactttttat agcgttggtgc aaggtactca taagattag gctgttacc tcccaacaga 16740
actggaaagt aggtatgcta tctggtaatg ttacatttc ccagatcctt gagaacagaa 16800
ttcctaggtc ataaagctga caaaaggctg attcagtttt taaatatata tatctgtata 16860
tgtatttca 16869

<210> 65
<211> 15000
<212> ADN
<213> Homo sapiens

<400> 65
gatctcttga tccaggagg tcaaggctgc aatgagctaa gatcaagcca ctgcattcca 60
gcctgagtga tagtgggaga ccttgtcttt aaaaacacaca cacacacaca cacacacacg 120
agggcctttg accactcttg agtagaagac tccagaagaa caaagttagaa ggccagagaa 180
gacaaagtgt acttgaagaa tctcttatta aagagaatgt acaagctatg aaaaaaaaaa 240
aacacacaca cacacacaaa cctcatctgg atgaaaaaaa acataattga tttggtttct 300
ggttccttag gctgtatttg aacaacaaaa gaacattatt ttggtttctg aggtcagaac 360
tattttatc cctcaagca cactatgct atgttttgag ggagaatgag aaataggaaa 420
ctaggaaacag gctgaaatgg tctaactctg accatctaatt tctgcaagtgt cttattctca 480
tcttaaaaga gaatggttat attcgtctgt ctagcataaa atgataatga aaaaataaaa 540
gatcccgatc taccagacaa taatccccct gactgtttta atgcttggtt gagtatttgc 600
ttatgacttc agactttaaa agatggtctc cccctatggt cccattgtgt taatttagta 660
gcacatctaa tgcctgttta cttatcaaaa ttttactatt gttagtgtta ttaactactg 720
acagtccaat ttatttaatt gaaaagattg gttaacattt tatagtcaaa gtaattgttt 780
cctgtgtttt ttccctgttta ggttattgga gttagagta aagaatacat accaaaggcc 840
acacgttttg gaccctaat aggtgaaatc tacaccaatg accagttctc taagaagggc 900
aacaggaatc atttttggag ggtaagtaag ggaaatttct tcagacccat taatgttag 960
gaaaaaatgg agctaaaaga gctgggtggc tcacctttct catcctgtgc tgagaaatgc 1020
tggggctcac ccaataagat ccagcatccc catggacaca gggaattctg aacaaatgtg 1080
atgaaaccga tgaaatgtct ggcctgtagg tggtagtga tggagatagc ggctatatgt 1140

gaatcttgat	ttttgcaatt	catttagagct	ttgtaaatgaa	aggaataacgt	ttgttgccttg	1200
ctttaaggat	aggcttcatt	gcattttctcc	gcaaggaaagt	agtaaatgagt	taccaagccct	1260
tagatttcac	ccctctttga	ttcttctgtcg	acttaactctt	aattgacttg	aagagtattct	1320
acaaataaat	tatctttttg	gtttttttttt	ttttgagatg	gagttctccac	ctgtccaccga	1380
gctggagtg	aatggcagta	tctcgggtcca	ctgcacaacct	cgctctccag	gttcaagcaa	1440
ttgtcttgcc	tcagctctccc	gagtagctgg	gactaaaggtg	cgcgccaccga	tgcctcagtta	1500
attttttgat	tttttagtaga	gacgggggttc	cactatgttg	gccatgatgg	tctcgatctc	1560
ttggacctcgt	catccgccca	ccttggccttc	ccaaagtgtct	ggaatattcag	gcaagagcca	1620
ccgcccgcag	gcaggaaatga	caaagtgaatt	accttataag	taaatggccat	taaggaaagga	1680
tagctgggaag	atgggtttgag	gggaatggag	gaccacagaa	ctagtctctat	ttaataacat	1740
gtgcagtga	aaatgattcc	atttgacaat	aggtttaatta	tctcatagca	taaggaaatct	1800
gcctaacagt	catatgcaag	atgataagct	ttcctatagc	atccaaaccga	aagatcttagc	1860
cagtaacaat	tccttttgcta	tattagggtt	agaaaggccc	ccagaggttga	accaattaga	1920
tggaatccct	gaataaaaaa	ctggatttagc	agtgaacaga	aaaaagtcag	attgctttcc	1980
tctctcccat	agatgctcca	gggataattt	gtttcctcag	aagataaaga	atttagtaag	2040
ctgtttttttg	tgcataactt	catgaaattg	acattatttg	aattcttttaa	aaagaaacag	2100
ctgcagtata	acaaaaattg	tgttatgctt	gctttagctg	gtatttttgc	ctagaaacga	2160
tatatctgtt	ggacacagaag	ctatttccaa	gaacaaatat	ttttaatcca	ggaagttttt	2220
cattttttaga	aattttatct	actatttccc	aagcaaaaaga	gggtagtgtac	agattctacta	2280
agaatcatgt	gctccacaatt	tttatttaat	aattattcct	ccttaaaaaa	tattataatc	2340
ctgactcaaa	atggtgggaac	catgagtcca	tttttgcctt	tattgtccaa	aacgtctctt	2400
cagaagtgag	ccacaaaagt	gcatagttct	tggagttcaa	ggctctgaatt	aagacaaatcc	2460
agcataagtc	ctcataatgt	gtgatttatt	tgagaaaaagg	caagaagatct	tagaagaatct	2520
ccccctcaat	gtccagttcc	ctgtttcatt	taaaagtcca	ctgtaagtta	ctgaaaaggct	2580
ttcctctggga	ggattttatt	gaatcagctt	ttccatgtca	aaggatattg	tagaagaatct	2640
cggtttttgtg	ggcaggaata	tgaactcatg	ttgtgaggaa	agaaaaaggt	tcatgcaaat	2700
taacactgcca	agaagggat	gttcaaagtt	agaaaaccagt	gacatttctt	gttaactctgt	2760
tatgaattcag	cgcatttttaa	tcttctagat	aataatattga	agtgcaaggaa	ggtgtgtaga	2820
aaacggtgttc	atttttacct	tgcgttattt	tattctgtgt	gagtgaactt	atggcaaccga	2880
catgtgctgt	tttaaatgag	gatcaagtaa	atttgcagct	gagggaaggct	aactgggaatc	2940
aaacatacccg	tagcttttaga	aagcagtttc	cgcaccagcg	aagagtacaa	gactcatgga	3000
accccatggt	cctgggaagt	tgcacatcag	agtaaacaaa	cttgaaaacc	cctcttgata	3060
gcagaaattca	cccagccttg	ttccattttc	tcttaacaaa	acacaccgca	aaagctctcca	3120
caagctgctt	tgatgaagcc	acatgtattt	cccccttcac	aatttaccgg	aagttactct	3180
taaaagaaag	tgattctgtg	gtttacggcc	tgtgttaag	ggacagagtg	ctcttttact	3240
tctgataacg	tttgagcgaa	atacagaaac	tatctgtaga	ctagcatagt	cggtagctga	3300
gtaaagaaaa	gcaataacct	gctgtccggt	gagcaaaaaa	ttcctgtctac	gaacagtgct	3360
ttaactgtgc	ttggagaactg	caagtctcag	atccacatag	gtattgtcag	attgtataag	3420
gaatattctt	aaagctctaaa	gtaaaagttg	tacctctcaa	aaagagggga	agagagaaaa	3480
ctttgtgtgg	aaggtataagg	agtggtgtta	tagttttcagt	aagagtgtac	gttttaattt	3540
ttcttctctc	tctgcctctt	tgcctaaagt	ctcgttagta	tctgttatcc	agaagttaga	3600
ttactcttag	acaaaactcca	aattcttcat	tctcgttgca	ctttaaggaa	caacataact	3660
tcttctctgt	ctttttccaa	aaacacacgc	ctatggctct	gtgtgtgggt	ttttagccag	3720
ctctctccca	taagagggtg	tcctcttccc	cccttgcatt	gaaaggaaaag	tgcgaagctg	3780
gacatgttta	tcaagaggaa	aagtgaactc	tcagttaaat	actgtcaaat	ctgggctgct	3840
gcccagtggt	tcgattttgt	atggcagggt	aaagttaacct	ttgccccacc	cagtggtttcc	3900
acaaaaaggc	aaggttccaa	gtattcatat	gaacaaagtgt	tacttttagga	cttggggggt	3960
tgggggttga	ggatgtttgc	atagttgaag	ccttggcgcg	gggtgttaga	aacgggagct	4020
acagagccca	tagaaaaagc	taagactcag	tttgaagctg	tcagccggct	gtgctctca	4080
cccagtgact	caagaactca	aaagtccagca	taatccggaa	tgaagtcatg	agcatcgccc	4140
attttgctatt	cactgcagta	gcaaaaagtag	tactctgtgt	tgggtttaac	ggtttgagcg	4200
agctccctaa	atgaacattt	gtgttttcatt	ttctctgttat	tttcccgaa	atgaaaagac	4260
gataaaactg	aaatggaaaa	ggtaactgac	aaaagtgtgc	cttaacctgtt	tcgcctctga	4320
ttctctctga	ttcaagacta	tctcggctaa	actgatgtga	ttctttttct	aactgagcag	4380
taggggatca	gaatacacac	acggtaccgg	ctgtgtttat	tctgagaggt	gctggggagc	4440
tttgggtctg	actctccctt	acatgcctgt	cttctctctt	ggacagatct	attccagag	4500
ggagcttcac	cacttcatgt	acggtcttaa	tgaagagaaa	agcaacttga	tgcgctatgt	4560
gaatccagca	cactctcccc	gggagcaaaa	cctggctcgc	tgtcagaacg	ggatgaacat	4620

09719554-011001

ctactttctac accattaagc ccatccctgc caaccaggaa ctcttctgtt ggtatttctg 4690
 ggactttgca gaaaggcttc actaccctta tcccgagag ctgacaattca ggcattctca 4740
 taagtggatt acagaacaaa aaaaataaaa atgcagataa tgtcgtgttt tgcctcttgc 4800
 actaataaca tgttgtttaa ttatacggct ttgtcatgtg ttgagtgaag taagttggtt 4860
 aagctaggga ttgtggaag gaaaaacatt ttgttagtcc ctatttaacta ttaggtaact 4920
 tgatcata tta aaagtatata tatatctgag gagctacccc gagttttgaa tctcagatgt 4980
 tacaggaaga aatatatgtc caattctaat ttatccaaaa cgagtttgga gaatttcagg 5040
 gatttggcca gacatctgtc gtatgcaagg tatagccctc atctgttgga ctctggcgag 5100
 ctttagactg ctacaataa ttatagagat tacattttgag tgtacagtta ggtactgag 5160
 tggacaattt taagatcatt gctagaaaaa ctttgtcata atttttcaat attatttcaa 5220
 gtgaataacc gtaaaatttt tacatcttag ctctctctct tacagtaaaa aaactatctg 5280
 atctcttgat cagtatatta gttagccacct atcaccttat cttaacaaat tctcaattcc 5340
 ttaggtttat gtgcttttacc ttctttttat tgattaaaaat tgcgtctcat accctctctc 5400
 cgagagggtc gcatcatttt ggtcattctc aagtgtatct tttgagcaat ttaagattgt 5460
 ccataagatt ctaacctctg ctgtaactat ggttgtgtgt tcttggttag accactaaat 5520
 ttttttagca gttttaaaaa ttattctctt tggtttagaa gttaaagacta aatgctgaag 5580
 tttttgtaac ttttgtttt gatctcatt caaacatttg aaaaacattt aagaaaaggga 5640
 caaagaattt ccaacttacc tttaaccagg tttaaccagt attgataagt atactcattt 5700
 gctttaccag aaggcttaact tgttttagtt ctcaatttca cctttgagac ttgttgaaata 5760
 aatatcaagt ttaacataaa ttggaatttt gactttgatt ttaggaccaat tgaacagcc 5820
 aagatctaac ctactgtata tataatccaa ctgtatggtt attttggtat cactccacac 5880
 tctattttac ttgactctcc ttaagattgc aagatttgtt tgcagttttt tctgaaaaac 5940
 tggggctata aaagcatcag gacctcccc gtaggggag tgcgtgtttt ggggtctcta 6000
 cacacagggt taacctgtgag cttagggaaa agaactggct ctacgttccc cagttccagc 6060
 ttaattgggtc taatttagct ctgacccaaa aggtggcagt tttttctcagt ctgtctctt 6120
 cagcgtctccc cggagctgtc gagactctgt catatcccta gggctgagcc tcccaggaa 6180
 cactcggctgt ttgtgctatc tgtgtatgcc atgcccagt ctgaggacgt agtaacaaa 6240
 gcacaaatgca caggtcacgt ggcatttttt tggaaactgt attccagctt tgcgtctcag 6300
 aagaaggcca cagctcccc ctggcttttc taacatact agccaacttc acttaagggt 6360
 ctctcttaac tcccttgagt taactattca tggattcaga ggaaagttct ttgattttt 6420
 tttttcttta aaacagttcat ttgaggtgac ctaccocagt gaactttgac caaccocaa 6480
 gaaacttttt tgcactgttc cgcacccctg tgcacattca gggaaagggt taaaggcctg 6540
 ggtgtttttt tctccaaaaga aagggtttgc acagtattttt aaggtttcaag tgcctctact 6600
 ttgtgttcag aagcaactgt catataact gtgaaatgac acccttttat ttctcccttt 6660
 tttttatgca gtatgtcccc ttattttttg gcagaatttt ttctaaaagg ttgtttaaca 6720
 ttttcaagca catttcaatt tccaatattc atagataaga atgagagttt acaataacca 6780
 gtccacttaa aacaagattc ctgctgccag ttgtgaaacc ggttgtctta ggcgtggag 6840
 ctgatgattg agactgtgat caggaaaaat tccactatt ctacagacct aatagtaga 6900
 ttgtgtctcc aaatggaactg ttttgggttt ccattgctta agcaacatatt aggtgggca 6960
 agaactctcca taggggctta atgggcagtg atggttcagg cggtagagt ttgagaaga 7020
 gggatttgaa acaaacccaa ggaagaaaaa gtaagttagc agaaatcaca aaatggcatt 7080
 ttcttaaaaa caaagaaaaa ggaataaaag aactaataag ttggaacaaa ctaccctcc 7140
 caaattttggc agggggggag gtattttttt tctatctatc taactaacc ctactgaaaa 7200
 cagttgacca aattatagag tcttaaatgt taactctgct ttctcagttc agttgaaaag 7260
 agactttgtt ttgctactgc cagaactctc aggttctttc ttatagtttt ggggttctta 7320
 ttatagactg aaaaattgtg tggcataaat taagccatc gaagctctca gaagctaac 7380
 actcttgaaa tgaactctgc cgctacagc catttaagat tcaagaacaa aaacagatt 7440
 tgaatttttt ttctcatgta actcaagctg ttgctgagtg ggagagatga aatgacac 7500
 agctccactgt attactcagc tgcgtgaagg tgatttttta aaatgcacct ttaactgata 7560
 tggacttctc aatttccacc tgtagagcat ctaacatctc actctggagt 7620
 ttctttttaga ataaagtga aatctatttt tctgaaggag tttagatag caaacattt 7680
 ttgtgagttt actataact aggcactgtg ctaagtgttt ctgaagtgtt ttctaaact 7740
 ctggcttttt tgttgccaca atcataagtt tcatatcagt tcaacatcta aattatatta 7800
 aggtacttaa gaagataccc tggctaaagt tgaagggcag tggcacagat caaggtgag 7860
 ttatgtctta ttgcacatt atgctatta tatttgttga attatagaac caagggagt 7920
 tggagccca ttgaaaaaat atgagacta gatcataat ttgagtata atggtcaca 7980
 gtcagtggg taaagttttt tttatttcca ttttattcga cgggcatcgt ttttaaaaat 8040
 cattatgaat ttgacctat atagattgtt ccaataaatt cttttccac ttcatataat 8100

tcccttcctgt ggcctgtgaga tgccttgccct atcagttttc aagccttagtc gtcctttctca 8160
 tccctttacca tttttagcttt aaaaaacaaa agtgacaatt agaacttctct gctctgctggg 8220
 cctcactgaa agaccgatat tggcctgata agggagatat tatcttggtt tagtggctttc 8280
 agaaatccct ctcctctcagc aagctttcca tcacggccccc cccgtcagca tcttccctgta 8340
 tagcgttctct cctctgtgttt attctggggc ttcaggctctg cccaggagctg cctgataaac 8400
 gctgcgcagga gataacatct tctaaggggc tctcaaatgt gaatcgaaac cctcaagcca 8460
 gtgcgactag agaatacatc taaaggggtc agttctggag ttctacagag tctcttctca 8520
 gacctatcag atagcaagtgt tggagttctt tctcaactaa attcaagcag agacactttt 8580
 tagacgatag atagattttg cacaaggctc tcagcatgat ccccaaacct gttctgctct 8640
 gaaggctatg ccacacattg acagccaatg ccttcagtgct gttcctaggg cagggtgctct 8700
 ggcttgagtg actgtctctc aataatcaga gctcaaaact aacatcgatg gttttacttt 8760
 tgggttccag gcaaggctga gcaagggaatt ttcagttttc cctgccccaga tgggtgtttt 8820
 ttctggaagg catcatttat tgtgtagcga ggagacaggg ctggctgtgg cagggatagc 8880
 ctgaactgt cctcattgct gctgttctca aatagtatct taccacagta ataactgtcc 8940
 gtctttggga ataagtgctt tctccttagc ctgttctgtt tctctgggtg cctcaagtaa 9000
 ttgaactggc tcaggaaagta cctattgtgg tttggcagag tgaactgtca cgcctgtgta 9060
 cttcaggggc cagcaactgct gggatcctgg ctgacccaga cagagccttg gtgaagtgct 9120
 taggctgtct gcacatcgcg aggaagggtg tatcacttgc gctaagctctc ttggcatagg 9180
 cagttttgaac agggctttat caaattccta ttcaacaaga gtgaagagca aaattatga 9240
 ctgtgttata cttgaaatga gtcttaattc ttcactttta gttctcaggg tatgtctgt 9300
 tcccttaagt aaaccatgaa ctacagaaaag actttttata acctatgaca gttctccact 9360
 cccagatttt ttccactcca ttaaaatgga agttttttt ttttttttct tttttgagac 9420
 agagtttttg tcttgttgcc cagctgtggg tgcactggca caatctcggc tccaccacca 9480
 ctccaccttc cagattcacc cgaattcttc gctcactttc cccaagttag tgggattaca 9540
 ggtgtgcgcc accacggccc gctaattttg tattttagt agagatgggg gttctccact 9600
 ttggtcagcg ttggtctgaa cttccgacct caggtagatc cccacccttc tctcccaaaa 9660
 gtgcctggat tacaggcaag agccactgca tccagcttag gctatcttac tccagcctaa 9720
 accaactatt tctatcataa ggtctgtact aatgaaaaaa gaataccca accctcgctg 9780
 ttgttctgtc tgtgctgcga ttgtccgcat ttgtgtgag aggaacaggga actgcaactt 9840
 tgagttagtg gccacagacc tctagaaatg agagtgcgtt ggagaccaga tatgtggcga 9900
 ttgtgtgcgc agctgttact caggtttttc caagaaggag gagcaacttt ggcagttttg 9960
 cttcagttct ctttagccct ctgtgtaatc gcccttttt ctttatttca gcaaaaaaac 10020
 agagcagttc aaagcaaccg agcactgaga aaaatgaact ctgccccaaag aatgtcccaa 10080
 agagagttca cagctgtgaa gaaatcctaa aattggaact caaccccttc aaagaaaagg 10140
 acctctaccg ttctaaactt tcacccctca catcagaaaa ggacctcgat gactttagaa 10200
 gacgtgggag ccccgaatg ccttctaccc ctctgggtct ttaacctat cgggcccctc 10260
 tgcagaaaga ctttttgaaa gcttccctgg cctacagccc ctgagagacc acctaatca 10320
 ctgcctcccc catttccatc tcacccactc caagcccctc tgcaagaagg cctgctgacc 10380
 aaagcctcaa gagctccagg cctcaccaga gccctgggaa tacggtgtcc cctgtggggc 10440
 ccggtctcta agagaccgg gactcctacg ctctactgaa cgcgtctcact gcgcaggag 10500
 gtttgggctc ctacccctggc tacgaccccc tgccccact cccgcagcgt tctatcccc 10560
 cgtacaaagc tcaactaaa aagtctctct tgcccccta ggcactgaat tghtaatggc 10620
 tgagcgtctg gagcagcatc aatggcctca acaacttttg cctctctccc aggctgtgac 10680
 ctgtctacag caatctctct ggtgggggca gctgcgccca ccccatgctc aaccccact 10740
 ctctcccgag ctgctgtgcc tcagatggag cccggaggtt gctccagcgg gagcatcca 10800
 gggaggtgct tgcctcggcg ccccacagt ccttctcct taccggggcc gcgcgcaac 10860
 tgaagacaaa ggctctgagc cccacaagcg ggtctccacc ggccgggaaca gccgcagcg 10920
 caaaaactgt gctgcagccc aaagctacct cagcagcat ggacgccccc agcagcgagc 10980
 aagccatgaa tctcatataa aacaaaaaaa acatgaccgg ctacaaagac ctctccactc 11040
 cgctgaagaa gcgaagacgg aagatcaagt acgaattcaa cgatttgcgc agacttttg 11100
 gccagctctc caatctgaaag gtaggccttg agagagagca gtccaaaggg ctgtgagtg 11160
 atgcttgtgt ttgtatttag ctgtgtttcc atggggtatc gatttgattt cagtagtat 11220
 gagccccggg ttggggatag ttggatagga ttcccgctgg cttttgccac tctagactgt 11280
 ttgactttgg acaagtgact tccctctccc tgattttct ctgaataata aaaaattag 11340
 ggggtttggc tagaagatta ggtgaaactc cctgtacgac ttgtgatttt gtcgttttaa 11400
 gaaaaacacc attctgaaaa catgaagatt tcttctttt aagacttttt tgaattttt 11460
 cttaaagat tttgcatcac acttgagctc tggagcagaa atgttaggct tcaagccag 11520
 cttgagagca gagctaacac atgtggcttc tccccaggc cacttgagag tgcacagtg 11580

00719554-034604

agaacggcct	ttcaaatgtc	agacttgcaa	caaggggctt	actcagctcg	cccacctgca	11640
gaacactatc	cttggtacaca	cgggagaaaa	gccacatgaa	tggcaggctgc	gcagtatatt	11700
ctgggtagac	cttctcgact	ttgtagaaaa	tgctgtgtgag	tcacctctcc	atgtctctaa	11760
tagcccgtag	ttaaaggcaa	caccagatcc	tgcgtttgtcc	catctctggac	tgatggcact	11820
atggctcttc	ccagttacttt	gtatctgctg	atgacttgag	atggcacagc	cagcttccag	11880
tgggtgggaa	aatggtatgg	gaaataaaca	gccctctcgt	tgtctgtgtgc	ccaca-cccc	11940
ccgtttgtct	aataccacac	tggagggtgc	acaaggaggc	ttctcacctc	ctaggttgct	12000
gggcgtgttc	cggttaagct	gccctcccg	ttggcaactc	ttactctctc	ggccttccgt	12060
tctcccttcc	ctcgtctctc	tctccctcac	accgttagtc	tggcacaaag	ctgttagagc	12120
caccagcaat	ctcaagaccc	acctcgcatc	ccattctgga	gagaaaccat	accaatgcaa	12180
gggtgctccct	gccaaagtca	ccagtttgt	gcacctgaaa	ctgcacaagc	gtctgcacac	12240
ccgggagcgg	ccccacaagt	gctcccagtc	ccacaagaac	tacatccatc	tctgtagctc	12300
caaggttcac	ctgaaagggg	actgcgctgc	ggccccggcg	octgggctgc	ccttggaaag	12360
tctgaccoga	atcaatgaag	aaatcgagaa	gtttgacatc	agtgacaatg	ctgaccggct	12420
cgaggacgtg	gaggatgaca	tcagttgtat	ctctgtagt	gagaaggaaa	ttctggccgt	12480
ggtcagaaaa	gagaaagaag	aaactggcct	gaaagtgtct	ttgcaaaaga	acatggggaa	12540
tggactcctc	tctccagggt	gcagccttta	tgactcatca	gatctaccoc	tcattgaagt	12600
gctctccagc	aaccactatc	ctctggtacc	tgtaaaggtc	aaacaagaaa	cagttgaaac	12660
aatggatcct	taagatttct	agaaaacact	tattttgttt	cttaagttat	gacttggtag	12720
ctcaggggtg	ctgtgactga	tggcctgtac	ataatccagc	ctctgcgaag	ctctcccgac	12780
agcaaatggc	ttccccctac	ctctggaaat	ctccaaaggt	actgaaatct	actgaaatct	12840
cagggcactg	acaaggcaaa	ggccatata	atatataat	atatatctgt	atacatatta	12900
tatatactta	tttaccctgt	tgtctatata	tttgccccgt	tgtattttgt	atatttttgt	12960
ggacatgttt	gcatagctct	cccattacta	agactattac	ctagtcaaaa	tatttttttc	13020
aatgataatc	ttcataaatt	tattatacaa	tttatcattc	agaaagcaat	aattaaaaaa	13080
gtttacaagt	actggaaaag	ttccctgtaa	tttgagtata	aatgtatttt	tgtcctgtgg	13140
ccattctttg	tagataaatt	ctgcacatct	tgtaaagtag	ataagattta	gttaacaaaa	13200
tatatagact	cagccaactc	ctctctctaa	taatgggtct	aaaaatgagt	ttgggttaatt	13260
gccaatgttg	gacagttgat	gtgttcattc	ctgggactac	atcatttgaa	cagcatgtta	13320
cataacttgg	gggtatgtgt	gcaggatcac	ccaagaatac	cttaagttag	agaaaaaaga	13380
aagggaatct	tgtatatatt	tgttgtatgt	tcattgtttt	ccccccagca	caattttacc	13440
ggaaaggtga	caggaaaggc	ttaccaacct	gtctctccct	ccaaaagagc	agaaatccctc	13500
ccaccgccctg	ccctccccc	cgagtcctgt	ggccattcag	agcggccaca	tgacttttgc	13560
atccatttga	ttatcagaaa	atgtgaagaa	gaaaaaaaag	ccatgtttta	aaacacactgc	13620
gaaattttcc	ccaaaagata	ggtggctttg	tgtgtgtgct	attttggggc	tgtagttcgt	13680
gtgtgttttt	gttgtgtgtt	ttttgtgctt	tttttttttt	ttttttttta	atgtcaaaat	13740
tgcacaaaaa	tgtgtctcta	ccagggaagg	ttcgaggtag	atagggtcag	gccacacttt	13800
aaaaaacacac	acacaaaaca	caaaaaaacg	gtattctagt	catcttgggg	taaaaagcgg	13860
taatgaacat	tctcatcccc	aacacatcaa	ttgtattttt	ttctgtaaaac	tcagattttc	13920
ctcagttatt	gtgtttttac	taatttaagt	tgatttccagt	agagatgaaa	ggcatttcca	13980
aagttgttca	acaaacagta	cctcatttag	tgtgtccagt	agtgcaggaa	atgatgtctt	14040
atctaattgt	ttgcttctct	agaggagaaa	ccagtagtaat	gtgctccagc	agaatagact	14100
ttgtgtttat	ctatctttta	ttctgctaaag	cccaagatt	acatgttgtg	tgtcaaaagt	14160
tagcaaaaaa	tgatgtatat	ttataaatct	atttatacca	ctatatcata	gttatatata	14220
tttataacca	cttaaattgt	gagccaagcc	atgtgaaaaga	ttctactttt	ctaaggggcaa	14280
aaaaaaaaaa	aaaaaaaata	gaacactcct	ttctgagact	ttcgttaata	cttgggtgacc	14340
tcacaactcac	gtcgtgtatga	tggggcacc	ttgcctactg	taagagaccc	taaaacctgt	14400
gtcagtggtg	ggggacacaca	aaacaaaccg	gaggagaagag	atcacatcat	ttttagttat	14460
aaggaccatc	taagacagct	ctattttttt	ttggccaact	tatgatttat	tggtcacacc	14520
caagtcacag	aaataaaaaa	ctgaactttac	cgtctcaatt	ttctctgttt	octccttact	14580
aaatactgtc	acattaccoc	aatctatttt	ataattatat	ttgacatttt	gttcacatca	14640
actaatgttc	acctgtgagaa	gagaaacaa	ttcgaaata	ctggcaaaac	ccaagagcct	14700
tactgtgtct	ctgtaacttc	caagactgac	agctttttat	gtactcagtt	ttgataaaca	14760
cagctcttaa	ctgaaggttaa	accaagcat	cacgttgaca	ctagacccaa	racttttgat	14820
tcccaactac	tgtttgtgtc	ttttctcct	tttgtgtctt	cccatagtga	gaatttttat	14880
aaagactctc	tccttctctc	accatccatc	cttctctttt	ctgctctcta	catgtgagat	14940
ttgagccac	aatcaacagt	ggtttttatt	tttctctcac	tcaaggttaa	aactgacca	15000

<210> 66
 <211> 46340
 <212> ADN
 <213> Homo sapiens

<400> 66
 tatatttactt cagtaaacaga aaatgaaaga aatgttttaa tgttgcgtgat tgtattacct 60
 tcaggatcaa tagcagaagc acaaaccttc ttgaggagat gtcctagtgt gtgcaactgt 120
 ccatctgcag ccaacaggac aaacagcttc tgaatgaaag gctcttcagt cgttgtctat 180
 ttgaaaagg aaaaaatgat tcaagcaatt aagtctttgt tgcctgccaat tacaaaaatta 240
 tataatcataa actttatggt ggcatttaggt gctctttgat acggtgttag cataattaca 300
 caacatcaca gatgtgggtat cactgtgaaa aatgtttaac atgataaatt caggtaaatc 360
 taattctgag gaaacagaca aatccaaagt tgggtggggac attcctaaga taattggctg 420
 ggacccttca aaaacttaaa gacattaaaa agcaaacacac acaaaaaaat atcaacaaaa 480
 gcattttttc tcaagtatcc ttaaaagagac taacaaagca aatacaaaaac ataaaccatg 540
 gctgaatact aaattgaaga aggcattttt ttagaatatc aactatgaaa cacagttttg 600
 ggataaatgg ggaataacag aatggacaac tgataaatatt attgagttaa tgcataaatt 660
 cttaggtaca ataaggacaa tccattattt taagaaaatc attgttcaag tgtttaggaa 720
 agaagtgcga tgattcccaa aacttaattc ttcttctctt tttttggaga cagagctctg 780
 ctctgcacc ccgctggag tgcagtggcg cgaatccagc tcactgcaac ctctactttc 840
 caggttcaag tgattctcat ggctcagcct cccaagtagc tgggactaca ggagtgccgc 900
 accatgtcca gctaaatttt tgtattttta ctagagatgg gttttcacca tgtgtccagc 960
 gctggcttcca aactcctgag ctccaggcaat ctgcgggctt cggccctccca gagtgttagg 1020
 gttacaggcg tgaagcaaac gctcctggcc ccaaaaactta accatcattt ggttgagaga 1080
 gagacagaga gagagagaaa gagagagaca gagaatgtgt gtgtgtgtga agacaaaaga 1140
 aaaaataaaaa aataattaact aatgttgatt ctaggtagag ggtgtatgat tttagtagtt 1200
 tcattatttc aacttttoga taggtttcac aatttccaaa acagcagatc cagcattttc 1260
 atctgcacaa aactgttagc agcactacat cgttaattat tgcataaat cctcatgttt 1320
 tactcttaaa attgtttcat ttactaaatt tcttagtga tgaatggaggc tttatcatga 1380
 cagagtacag aggtctgaa atgagccagt gtctatgaag agcaccactg tttgcaagat 1440
 ctatgatctt gtaccaggtt tccattatct gttaatttgg gaacttccat atctcttgag 1500
 tttgtgtgg aaataaatga gcaactttgc caaccacaga gtaataaat aaattgttaa 1560
 gagaataaaa gcatttttac ctccctcttc cctcttaacg gtattttcac tttaaagatg 1620
 taaattttta gctttctgag atgaaaaatc attaaaactt acaacagaaca gagaatgcc 1680
 atacatacat attttttgtt tgcctgtttc ctgagacaag gtttcaactt gtcacccagc 1740
 ttgaattgca gtgtgtgcaac ccccaagttg caatcctcca cctaagcctc cagagttagc 1800
 gggactacag gtgtgagcca ccatgctcag ctaatttttt tacttttttg tagaaggggg 1860
 tctcactatg ttgcccaggc tgccctcatat ttataagaa tatgacttca aacacttagg 1920
 catatgagc aaggttttgt tttgtcttt taatgacaga ggtatacctc aacatatttg 1980
 acacaactgt tagagatttg gtttaaaaag aaatagacat ggaatgaagt ggaactatc 2040
 attctgcaga aactaacaca ggaacagaaa accaaacacc tcatgtcttc actcaaac 2100
 gggagctgaa caacgagaa acatggacac aggcaggagg acatcacaca ccaagcctg 2160
 tcggggagta gggggctagg ggagggatag cattaggaga aatcactaac ctgagtagg 2220
 ggctgatggg tgcagcaaac caccatggca catgcatatc tatgtaacaa acctgcacat 2280
 tctgcacatg tattccagaa cttaaagtat aatacaaaat gaaaaataaa 2340
 ctgaaaaaaa taacatagta agcatgtgag ctgcctttcc taattctatg tttatgtatt 2400
 gactgaatac atagattttt aaaaatagtaa tccataata taatttgagt tttgtgacaa 2460
 gatgaaaaat tgtaattttt aaaaatctt gatataatgc attgaatatg atttaataca 2520
 cttcatattt tgaactcttt agggattatt tttaaaaata tgaatgatat cctttgatat 2580
 tttttggctc tgtgtttcca tccaaatctc attcctaaatt gtaatcccca cccgtctagg 2640
 gaggagctgt aatcccatg tgcagaggga gggaggtgat ggggtcatag ggtgtgtttt 2700
 cctcatgttg ttctcgtgat actgagttaa ttctcatgag attctgatgt ttttaaaagt 2760
 gcagtttttc ctgcactctc atctctctgt ctctgctggt tctgtagatg cctctctccc 2820
 ttcttcccat gattttaagt ttctcagggc ccccaacaag catacggaa cgtgagctaa 2880
 ttaaaccttt tgcctttata aattaccag tctcagatat tcttttaaa agagtgaaa 2940
 acagactaat acattcttca atttaaaaag ccatactttc tcaatacaag tgaacacaa 3000
 aacaatatca tgcataatca agtgattaac tgtgtaaga taataaggtt gaggagttca 3060

gagaagaaaa gaaatgaata gggaaactgta gtgataattt aaaaatagcca tccctcactc 3120
 aggggttttg atccttcaggc catgaagaag ctttttaatgc ttttttagcaa aggaagtaat 3180
 gttgggtgaaa gctcttttctt gcgactaat ggaagcagc gctatgtta gtgacttgg 3240
 tatgaaaccaa aaccagaatg actggttgaga ggctgactga atacagcaag ctatgtgtga 3300
 gacacactgga gctggtgcag tggaaaaagga agacagcag actgtaccca caactcaaa 3360
 aaaaaagtca gaaggtacct cccgcagtc aacctgaaaa caacaagtc aaaggaatct 3420
 ttccaagatg ttggagctct catctatac ctaattagtg tatgaaatg gagggtggctt 3480
 tgcataaatg aaattacctg gaataattct aacacaaga aataataaat gcttgagggtg 3540
 tggaaatctc ctttttgatc attacacat gcattgttat agcaaaagt tcatgtgacc 3600
 ccataaataa ttgcaactat tatgtatcca taataattaa aactaaaaga ttaaaaaata 3660
 cctgaaaaaaa aatgctaaac aggaagagcc aactagctt ggttacata taataaaacag 3720
 aaattctctt ctaacctcac tatggagaa atatcctgtt atttttata atctttttt 3780
 tcaccccttc ccaaacttga gcaagtatta taaagggtata accttcaaca atcttttatg 3840
 atgaggtatt tgcttactcg ggaacaaagc ccagtgctat tacataatgt agctaaacgc 3900
 tgtagaatgg taataacaag aaaatgctca gcaaatgttt gtttctcat taatgaaaa 3960
 cttatcttaa aacacaaaaa ctcaatatac cccaaccaaa aatctgtatga acattttctg 4020
 tttaatatat actatacagt acccttaaaa acgtaatat cttattctta aaaaatttagt 4080
 gtgctagcaa atagcaatta agtacctaa gcaatcagga cgacaaaaaa atactcaatt 4140
 tggggaggtta ttacttctta tcatctgaat gcgtccctcc aaattctatg ctgaaacct 4200
 ttctctcaac tggcagttat aagaggtgaa gcttttgaga ggtaattagg tcatgagggc 4260
 agaggtctca agaattggat caatgctctt ataaagaag cccagggcag ctgttgtaact 4320
 ttttgccctt tctgcatgt tgggggggtg ggggtggggg gcgagcaac agtgctaaact 4380
 ctgaagcaga gaggagccct caccagaaac ccaaatctgt gaagccttga tctgtcact 4440
 cccagctctc agaaactgtg gaataatttt tctgtgtttt a-a-aattaca cagtctagcc 4500
 tgggcgttgt ggatcacctg aggtcaggag tctaaagca gccctggccaa tatggtgaaa 4560
 ccccatctct actaaaaata cagaaatta gctggtcata gtttggggag cctgtaactc 4620
 cagctactca ggaagctgag gcaggagaat caactgaacc cagaaggcag agtctgtcag 4680
 gaatcaagat cagtcaccat aactccagcc tggggcaaca geggcaaaa ctgtcaaaaa 4740
 aaaaaaaaaa catgtcacac tctaacaata ttgggtatag cagcccaaat ggaatggact 4800
 aagacaatta cccctaaaaa aaaagctccc atagagagat catgcattca agtcacagag 4860
 tctttaaggg caatgggaat ggaggacata ttcctgcaaa cttttcaaca gctctcatta 4920
 gcccgatgtt agagctctgc aaagaagact aaattatact gagaatatat tttaaatctc 4980
 cacaatatgg aatgctgtaa acgttgattt agtatataa aaattagaca agactcaaca 5040
 tatccaatgc atcttaaatc ttaggttgac agacaagaaa gccactgcaa acaggaatat 5100
 accacaatca ctgatcttgc cacatatttg taatatgca aagtatttca ataatctcca 5160
 agaaaacgta ttactctcat gagaataaac atgattgaag tcaactgtac aactgtcctt 5220
 gttacttttt caaatgtatg ttatgcattt cttaacacca aatgaaatga aaaactgagg 5280
 tggtaattgc tggctctctc catctctctt ctactcatgt gccctcaaca atacagcaat 5340
 cattttttct tatatgggaa atttacagtg ttgatatagc tcagagatat attgagaaaa 5400
 agcagaaaaa cgaactctat aaacatttta ggaacactta tgtattttct taatatgttc 5460
 aagtgtaaaa ctttagaatc ttataaataa tgtgtgttct agctatatgt taaatgggtg 5520
 ctcatgctgt taatccagc acttcaggag accgaggtgg gaggagagct tgagcccatg 5580
 aggtttgagc tcaccggggc aacacagaga gacctcatct cttaaaaaaa aaagaaagaa 5640
 agaaaagaat gaaatgcaaa gaaaagtcgt ctatttcaaa tgatgccagt agagcaata 5700
 ggttaaccaa tattaacatt aacgttgata aaacaagaaa tgatgattta ctataagctg 5760
 aaaaatcagc aatgtatgga ctttaagagt aacaggcacg atgtatgcaa acttaataca 5820
 ggttttgagt ctatgagtta tatacagtta catgtgcaa caaagatgct cagccaggtg 5880
 ttaaaagact tttagatcgg ctgggggtgg tggctcatgc gctgaaattc agactcttg 5940
 gaggccgagtg agggaggtac acgaggtcgg gagtccgaga ccaagctgag caatatagt 6000
 aaactctgat tctaactaaa atacaaaac ttgtcaggca tgggtggcag gcctgtaat 6060
 cccagctcat cgggaggtcgt aggcaggaga atgtctgaa cccagggggc ggaggttgca 6120
 gtgagcgcga atgcggccct tgcactctag cctgggcaac agcgaagag tctctgtcaa 6180
 aaaaagatg tatagtcaag tctgttttct gtcatttat atggaacctt gacacaaact 6240
 acctactctt cctgaacctc agttttttca actgcacaaa agcaatatat acatattgt 6300
 atatatatat ctgtgttaac acatatatgt atatatatat ctgtgtaaac acatatgt 6360
 atgtataaat ggaataataa cctacattat agttttctg atataataac gcacaaacca 6420
 attctgacac ataacaattt gtaacctaaa acataccatc accagggcca ctagttttag 6480
 aacctgttaa tgcatagtct aatttaatac tatgcaaac gtgtccactc aagggtttat 6540

ttccttttaa	tttcattcat	ttactcttca	gtgtgtt-gta	agctaaaaag	tccagaatca	6600
tgaaattcag	aagtttacgt	tttaattggt	tcttatatgg	caaggaaaaa	aaaaaggcca	6660
aagctatttt	aacactactt	tcaaaatcag	cctagaactt	aacactaaaa	gcatgacctc	6700
taaaaggaaa	tactataaaa	tagacttaat	taaaattaaa	caacaacaac	aacagctaaq	6730
cttttgttct	gcaaaagatc	ctgtgaagag	aatgaaaaac	taagccgcag	gctgggagaa	6840
aatatttgca	aacctatttt	ccgagaaaag	tcttgtgtct	ataatatata	agaactccca	6900
aaattcaaca	gtttttaaaa	aaagcaaaaa	atccaatgtg	aaaaaggcca	aaagactaga	6960
acagacattt	taccaaaagat	aatataatgg	tggcaaataa	gcataatgaa	acatatccca	7020
cacatcatta	gccattaaag	aaatgcaaat	taaaaccaca	atgtgtatat	attcacaccc	7080
taccaaaaat	tccaaaaata	aaattagtgg	taacaccaaa	tgctgggtgc	catgtggaaa	7140
aatagtccct	tggtacaaat	tggtacaaat	gcacaaacagt	acagtccccc	aggaagaagg	7200
tatggcagtt	tcttcaaaaa	ctaaacatgc	acttaccata	tgaccaagta	atttatacct	7260
tgaatatccc	cagaagtaaa	aatgtcttct	ccaaaaaact	tatacatgaa	cgttcatacg	7320
gtttttatct	gtgagagtca	aaaacagaaa	gcaatcccag	ggctacccat	taaaacaggt	7380
gaatgcttat	aaactgactg	taatatggct	gtcccacgga	atcactacta	gcaataaaaa	7440
ggaaacaaat	actgtgtatat	gcaacaacct	ggatagatct	caagggagtt	atgttatgtg	7500
aaaaaagtca	atctcaaaaag	gttacacact	gcattgactcc	actgatataa	cattagtgaa	7560
atgcacaaaa	ttttgaaaaat	ggaaaaaaaa	ttagtagttg	tcagaggtta	cggaagaaga	7620
gcagttaaggt	aggtggctgt	ggctataaaa	agagatccct	gttgtgaaaa	ctgttgaaaa	7680
gggttatatt	tgaatatagg	gtgaatttac	atatgtgata	aaagattgcat	agaactaaaa	7740
acacacacac	agtatatgta	aaactaagga	aaactgagta	aggtttgtgtg	atttatattaa	7800
tacaaattccc	tggttgtgat	actgtactgt	aaattatgaa	gatgttagaa	ttggggggaa	7860
ctagatgaag	ggatgtatga	tcttctgtta	tattttctta	caattgcagt	tgaactctgt	7920
attatctcaa	aatataaaatt	tttttcaaaa	tttcaaaaaa	actagtctag	agcttttgta	7980
atcaaaagtt	tctctggagg	ccgttagcat	tttgttatc	actgggatct	tattaaaaatg	8040
tagaattctca	ggctgcataat	tggaaattcct	gaatttgaat	ccgcatttta	acaaagattcc	8100
caagtgaatt	atgttttaag	tttgagaagc	actagtctac	aaacatgact	tttaaccttt	8160
caacctactc	taacacacct	gaaggccata	acaaaattca	catcaataac	agttgtctcg	8220
tgggacagt	actctcaaca	caaatgagtg	aggaagggtg	gggactcaag	actcaggtga	8280
caggaaaaag	cccttaggtg	atccctgatga	aaatgtttct	ccatccctgg	tgaaaaaaccc	8340
agaaacagtc	ataaaggctc	aaaaacaaaa	taattgttat	aatactggag	atcctttaaaa	8400
ggcagataat	ataactata	acagagcaaa	ggtaattatt	acaaatgata	aaatctataa	8460
gaacccaaat	cagaattaaa	atcacataagc	acataatgaa	aatccttttaa	aaagtataaa	8520
aatgaatgta	gtctaaagtaa	atactataaa	tggcagttat	agtgaagaaaa	gctctatagt	8580
cttttactct	tcaattctcc	tagtcacaaa	catctatttc	caaaactgac	cccttcgtatt	8640
tcaaaataatt	tgtgcccctg	tacagtaata	agagcatgat	atttaaaagg	agtgcagaaga	8700
cacatatatt	agctctggat	ggcacttgat	gacgatggat	tcagcttatg	gttcccaattc	8760
cagctctgtc	aatttagtacc	tatatgacct	tagtcaaaaa	cttaaacctt	ctgtctttac	8820
tttgtgtgca	attgtatcat	ctataaaatt	aggatattaa	cagtatatatc	ctcatagatt	8880
ttttgtgaa	ggttatacaa	ttaatctata	taaagtattt	agaacaagtgt	ctagcacagt	8940
gaatttctcaa	tgagtggtat	aatttgtctt	tttaaatgtg	acttgacctt	caacagaact	9000
ctactgaatt	ctcaatagta	tctctgattg	agctgtcaca	aaaaataaag	atttataata	9060
catatactat	tcttgtagtc	aaacctgtta	ctatgttatt	actagtgtca	gtttttgtgt	9120
tttgtctata	catatttgtt	tacatacatt	agaattattt	agaaatgttg	gtttattaaa	9180
aatgacattt	tatggctaga	agggatatata	tctggctcac	tgactgtgga	gtcaatgtcc	9240
ataaaagga	ggaagaatgc	catcagagta	aaaggagatt	ctattcaactg	aaacaaagtg	9300
ataaaaagct	atgaaagaga	aaaacataaa	ataccaaaag	gggtgaaact	taacagatgc	9360
ccagtagatg	cccaatgcac	tggtgttgtaa	aacttaaaat	ggccttaatt	aaaagccaag	9420
cacggatgga	ggtgctgggg	gagctctccta	cggacacagc	aggcagaagt	taacaaagtg	9480
aagggctcca	agttttattt	aaaaagagatt	ggacaggccg	ggcgtgtgtg	ctccagcctg	9540
taatccccag	acttttgagg	gctgaggcgg	gtggatcatg	aggtcgggag	gttcagggcca	9600
gcctggccaa	catggcgaaa	cctcatctct	actaaaaata	aaaaaaatga	ccggggaggt	9660
gtggcgtgca	tctgtagtcc	cagctactca	ggaggctgag	gcaggaagaat	cacttggaacc	9720
tgggagggcaa	aggttgctagt	gagctgagat	catgtcaactg	actccacgct	gtggccaacag	9780
agtgagactg	ctcagatctc	cccaaaagacc	caaatccctg	taaactgaat	gcataaatac	9840
atttgctcca	ggtgagctta	gatggacatt	ctagtctctt	tggttgagct	gaagaaacaa	9900
atatattatt	gataatttat	gtatgttgta	tttttcaagg	tatagcaaca	agttttttat	9960
catcagctac	tttgtgtgtg	tgctttgttt	ttaagctctt	tgaacacaga	tgggtattta	10020

ctacatttat aagtaaaatt tatttgattt acaaggggtt ctaagtgtat tcacaggatt 10080
 tcacttgtta tatttgcagg tgcttaaaaa atcagctata ctaaacatata actggaatta 10140
 gcaaatgtca tttattgatt aatcaagaatt ataattagat ttgccttaact atataaggtag 10200
 tactatgtgt tattttaagaa ttaaatctag aaaaggggat gactctggaa atatcaagaa 10260
 gtgaaaaaga ctgcctctat tttgtacaaa caattactaa atttctaagt agcattaaatt 10320
 gaactgaaa ggcatttttag aaaaactaga ttttacaatt tataactcta ataaaacaca 10380
 actaactatg agtgctgctt ttcatgcccc aaagctacct tccaaaattt aaaaacctat 10440
 tggatgctg ggtgcagagg ctcatgcctg taactccagg actttgggag gccaaagcgg 10500
 gcggatcacc tgaagctcagg agttcgagat cagcctggcc aatctgggtg actcgctctc 10560
 acaaaaaata caaaaattag ccggggcgctg tggcgggctg ttgtaatccc agctactcgg 10620
 gaggtcgagg caggagaatc acttgatcct gtgaggcgga gtttgcagtg agctgcaccc 10680
 gtccccctgc actccagcct gggcgagagc ccagagcgag actccgtata ttaaaaaaaa 10740
 caaaaaaaa ctcaaaaaac cctattggca attactagg ccatcaaat agtatatttt 10800
 cacttgacac acaattttga gataatgaac cgaacttact atttttgaaa atattacata 10860
 ataaaaatta gtgaagcttc attgctgaaa tggtagacaa gatgaatagc aataaaaact 10920
 tctttataga tcttttgcaa aaaaaaaaa accccaagca tactatggta cattacttta 10980
 gagaatacaag tagctgtcag ttgagtaata gtggtacaa gcactacaat gatataaaca 11040
 aattacaaca aagaatatgt tttttatttc ctgtccatgt tttaaaaaag ctttggtttt 11100
 acctatgttt aacaaaagca taggtacaac aacgactact actactaaca tataagtagc 11160
 ctgtgatgaa tttacttaat agtagtacc aagtgcagg tctctaagta acgatcagaa 11220
 ggacagaaata aattttatca gaattcttca tctactacat atttactatg cacttaccag 11280
 ggatcacta tgcctaattga taaaaagata aataactatg aaacaactgt aaacacagtg 11340
 tatgtgataa cagaaaatgt taaaaagcac tattgaaaaa attcaaaagc ttgagacaaa 11400
 attttaactc tggacttact ggcattttag gcaaaaccac aacaactcta actggttaat 11460
 tttacttttt aagatgtatga agctatatca gtatgtacaa agtaaaaatg gctaattgtg 11520
 gtgagaagta aatatatcaca acagtagaga atttcaaaag aagatataaaa taatggaggg 11580
 aataatgaag gtcttcaagc ttccagcttg aaacacatat ttttttctaa atagagacaa 11640
 agataaagtc atttgagtat tcagagggca gactgaatat aatggtactt ctgagaaatt 11700
 agtggtcaag gagagaaaaa tggactaaa ggcataagcat atagagcttg gaatgtcaaa 11760
 tgtagtggaa taacaaaagg ttgtgttggg atcccaactc ccaacaaact actgtgtact 11820
 tagagcaaat taacataacc ttggggagta ctgtttctga atctgaaaaa tgggaaaaac 11880
 ttatctttga acaattgagt tgataattaa atgagatata tgaataatct aatgtacaaa 11940
 gtgccttaaca atgactagtt cttttcttc ctctcttgaa ccaattgtgaa actgaagacc 12000
 aagaagaagta acagatttta gtgtgtacag aaccacttaa gagagaataa aagataaact 12060
 gtattctaac ttcagtttcc ttgtaagtct tggtaatgag aataaatatt atgtggcaca 12120
 aagaaaaaga aaacaggggt ttacacagga ttatgctgcca gactttacca acaatgacac 12180
 atgatatctg ctctcaactg cccatgcata ttggcttaa gatatttca tgcatactaa 12240
 attttacatc acatggtttt caaaaagaaga agacccattc caaatgaagt cttttagagc 12300
 atatacataa cctcattaaa taaaaagaac agagggggaa cagagagggg agtgggtggg 12360
 tttacagtaa acagtctttt acttatcaga ctacttttat cctttatgta gagaaatagg agagtgtgaa 12420
 agtctgtagc ataaagcact tctgtaccta tgttgagagt ctgaagccca cttttaatag ttctgacaa 12480
 actaaaaaat aagaatttact atttgaaaag ctgtcattat tatagttagg gacacttaat 12540
 cccaaaagaa gaagtatttc aattgataac atgattaaat aaaagcattc atcagaattc 12600
 tatccacaa ctggtttgga gtttatgttt tgtcttattt aaattgttat acttattata 12660
 attctgtcta gcaggtgcca aatgtacttt gtcatacaaa cacttgaggc aaattttctt 12720
 caaaataagc caacactttg ttctctcttc gtatcctttg actgaataac gtgtgggaca 12780
 gagaagtaat attctccott ctggggatct agatcaattt gatgctgtgt atagaccat 12840
 ttacagaaca agtggttatgt cttttaaatt tttatatgaa ctctacagta gactagccaa 12900
 aaaaagaagc tcatataaaa gtgctaggat tgactttctt agtaataatt gacttaattc 12960
 tctaaaaatt tctcccaaaa gatctgaaaa atcatacaaa ggggaagtata gtttaattt 13020
 cattatataa aatgatttca aaatatcttt gctaatttca cccaaagcca caaaaaaag 13080
 actaatcaaa aaagaatgtta attaataaac tattttcttc tgaagaatca aagggcactt 13140
 ctgcatatga acatgtttta tcttttgggt gtacttacct aaaaataata agaaactt 13200
 ttaatttaga taacaaaaga aatcaaaaat atgtctagat aaaaagactt aaagcagct 13260
 gtgctgacct caaaagtgtat attctgttct ctgtatgccc agtttaggct taaccagag 13320
 gaaaagtgat tctaaacctg ggcctaggagc tagtggagct cttaaacag tctcacctac 13380
 ccaacccctc caaggaattg tctatggggt ctgtgtgtaa cgctaaagtt tataacatg 13440

gaattttttat ttttttggttt ctaacacaaa taatttttaa aaattttatt tactaaaagt 13560
 acatcacaagg gaaattttcat aaaaattctt ttgaaatttt tagaaagtatg aaataaaagg 13620
 aagtgataaaa ttttttaacag atttcaccac ttacgtaatc ttactcaacaa atttttaaaa 13680
 catagcactt gaatactattt aaaaatatat taaaagggtta acatagtaaa actttaaaa 13740
 tcttttaaaaa aataataaaga ggaacacctt gtgaccttgg attaggaatt ggtttcttca 13800
 atacggcaac ctaaaaatcac aagcaaccac agaaaaaac agacaaactt gacttcatca 13860
 aagttaaaaa cttttgttct tcaaatgaca tcatcaagaa aataaaatcc acagaattgg 13920
 acaaaatttt tgcacaacct atctgataag agaccactat tcgaatatat taagaattt 13980
 gtaaaactta taaaataaaa gtttaagaag tcaattttaa aaatgagcaaa ggtactgtaa 14040
 acaattctcc taagaatatc gaatggctag ttaattgcatt gaaaagtatg ttatgactca 14100
 tggttcattag gaagagagcaa aaaccaaatt gatatactcc ttcataccac caagactctg 14160
 tgttaattaaa actatagaaa ataaagcgtt gccaggatgt ggacaaatg gaacccctcc 14220
 catacactga tggtagaatt gtaaaatggg gcagatgctt tggaaaaacag tctgacata 14280
 ccccaagggt ttaaacctgg aattaccatg caaccacgac attctactcc taagtactca 14340
 cccaaagaaa atgaaaaatat atgttcacca aaacatttgt acataaata taactgcag 14400
 ttttttcat aatagccaaa aagtggagac aatccacatg tctatcaat ggtgaattga 14460
 taaaacaaat gtggtattct catacaacta ttactgggcc ataaaaagaa tgatgtattg 14520
 atacatctga caaaatgaat gaaccttaaa aacaatatgt aagcaaaaga aaacagaca 14580
 aaaaagccat atattacatg atgtctaatta cataaaatgt gacgaaggga gaactaaatt 14640
 agtgaattgcc aagggtctgga gggaggggga atgataaag tactgtccaa tggcactggg 14700
 gtgtcttttt aggggtctga aaatgttctt acggaagtgt tggcaaaatg ttgcaaaatt 14760
 ctgtgtaact tagaattcgc tgactcctaa aaccaatgaa tagcatgtgt taagaagtga 14820
 cttttgtgta gcatagtgag tatagtccca gctacttggg aagctgaggg acagagactca 14880
 ctgtgagccag gaggtccaaag ctgtactgca ctatgatcat acctgtaaat agccaccata 14940
 cacacacagc tgggtccaac agacatgttc tctaaataaa taaaacaaata aataaataa 15000
 aggggtacat ctgtagtatt gagattatcc ttcaagttaa ctgttattaa aaaaaaaaaa 15060
 gttatgactt ggggtgaggt gaaaatcatt ctgggattat ggctaaactt acagattgt 15120
 gattttatcc ttatgataact accttatgtt tgttttatgc tttttgtggg atttttaaaa 15180
 aaatttatatt tcaataaaac aaatttttaa aaaaattaaag tcaagaaccc caaacacaa 15240
 aagatcagag atacattttc accttatcaa ttccagaaaa ttcaaaagt tttttctaa 15300
 aattgtatag catcatgggt attttaagtt acctgtagga atttaataaa ctttgtctaa 15360
 actgttcacc aaaaactcatt taatattcat gttctgtatc tgaaaatgaa gctgaaaaag 15420
 ttgtgaaatta caatatgcta gtttaaaaag gtttactaaa atacataatt tcatataag 15480
 vataataatg atcaaatatg acactaatat aaatgtctt acctaaaca actcaaaa 15540
 tgcctccccc attctggact cactggctcc actgtttgcg agcttttccc gaacgctcgc 15600
 caccagttag ggtagccaaag aactcctcat cttcactttc ttcttccata ctgtgaaa 15660
 tctggattcc caccacactg cgtgtgaact gaatggggaa gagaaaacgc atagttaagg 15720
 aactcttctt tttatgatt tctgaattag aatctggcat tcaaaaagaa caatgttata 15780
 aatccaggtc agagtttata gttctatttc actattactt aaatggcttg tcttaggaac 15840
 ttaactatta ttacaattgt aagtaacctat ttccacaaaa aattctcaaa ttttggaaat 15900
 caatattctga agagagaagt gtctattgaa tccaaagttag gctgatacat cccaacagta 15960
 tttagattg agataaataa aataccacca attcatcaag tcaaaatata gttctatttt 16020
 ccacaatgga agttttaaaa tagtataaac attttaatat atagcaggct taacttatga 16080
 tttaaaaaa gggttctaa gaaaatagta acatcaataa ttaagtgtct tctgtataa 16140
 tttaggtgac aatttatcca tctgagaatg gcaaaagaga ctttggttag gggttgagt 16200
 aggaagcttc tgtgtcaaa gaaactcact tatactgtag tatactgtat ttacaagct 16260
 taatcactgt acttatttta aatccctctt cagaaaccgg tcttaaaaga tgataaaca 16320
 ggcctatgta ataaacttca accaaaacta agaaaagagt gcaagagtgt ggtgttctaa 16380
 tctaaaaat ggtgttttat tcaaaatatt ttatttaaag ctccaaaagc agcagctca 16440
 ttcccaagaa atcatagtta aatgaaatct tccctactaa aggaaaaaag aatcacata 16500
 tttaacgtga acattttaaa aacactctaa agcaacaaaa ctattcaat gtaatgtgata 16560
 tggcttagaa aggcattgag gtaaaaaagg ctaaaaactc taataatggt tgggcaaaaa 16620
 gtaaatttgt tagttctcat ccatatagca ttctccaagg agtgtaaaaa tcaagattca 16680
 agttactact tctgtgtgag atcctttgaa agccactcta cctgtttta tatgaagct 16740
 ccgcagctaa aatgaacact tagtgaagag tatgaatgt gcaatcata agcagactc 16800
 agaattgtcc caagctgatt ctaagttact taaaactatg atcagagatg aqaatatgac 16860
 ttacttctta gaagtaaacg ataattacct ttggcatcat gaaaaaaact ttaaatgata 16920
 gtaataacag gatttttccc tttagcaaa ctttgccttt aaaaagaaac ttcaaaactt 16980

aaattaaaat aggaatatgt ctactatgta gtaaaaatct ttttttagatt actgaagcaa 17040
 agaaaaggaa ggattctatg agggaggaaa agtggggaaa aaattgaaag aaaaaaagaa 17100
 aqaaggaaag aggggaaaag aacacaagga agcaaaagggc taattgaaata 17160
 tattattatgt tccaaatattt aaacgagcag aataaaattct tttgttttat aactatgaaa 17220
 taattctatgt tccattctatc tatgcttggaa aaattttgac aaaaattgttaa gactaagtac 17280
 tcatctggat ttcocgggctc tcagctctgaa aaacaagctg tttcttaaca tacgtcaatt 17340
 tctctattct catgtctattt ctattttgcaa atgtttataaa gtccaattatg atgtaaaaca 17400
 tgggttaaatg aaagtcaaaa ataaagtataa catcacattag tttggctatt ccaaaatttca 17460
 tgcacattaa ccgcgccaca catctaacac agtoagccctt cctcatccag gtgtctctgca 17520
 tctgcagatt caactaaacca tgggtcgaaa atgtttttgt accaaacatg tacaggcttt 17580
 tttctctgtt atcattccctt aactacagta taacaactat tttcacagtg tgtacatgtt 17640
 tatgaaataa tataagtaatt ctacagataa tttaaagtat acaagagggc atgcataagtt 17700
 tatatgcaaa tactacaaac ttttatatca gactctcaaa catcagtaga atttggtaac 17760
 ccaggagggtt cctggaacta atcaccacaga ggtatcgaca gatggctata tataaaatcac 17820
 tcagtgaaatt caggattcac attatttcac aactagtata attttatgtt gtccacataa 17880
 ttgtgtcaca acatataact cgacagaggt gactttcatg aaaagattac acccaagata 17940
 gacataatgt ctactcaaat acggtttcca aatgtgtatc caatcttgtt taattataat 18000
 caaactccacc atttcattga taagcgacct ctaccaacct gcttatcccc tccaagcaat 18060
 ataacagttg tttctctgaac caattattgac cctcccttaa attgatagcc tttttttaaa 18120
 aagataacca ttgagaagta catactgttg aagacagaaac atattctcta aaagtctccc 18180
 agatatacaa agtcagatga tacaactgaa ttgttatgct agatttatatt tctaagctga 18240
 gaattacatt ttaatatacc ataaagcaatc tgcataagaa gcaacttgcc taaagatttc 18300
 agagttttca agtatgcata tgtcaatatt tgtatcaata tgaataatca atataatcaa 18360
 tgcacacaaa aatacgttaac tgtacttata tcatctcctt agcactaaat attacaacaa 18420
 atctgtctgc actgcacaaac aaaaagtataa taaaaaaatc caaaaaacct tgaaaattta 18480
 ataaaacctg aaaaacaggca tcacacacaa gaactgaggc gtatacttca ttaagttaga 18540
 tgaattccatg atatgcaatt tcaaaacaaa ttaccaggc tcagggttaga aataaagata 18600
 ggacattatg tttctgtatt ttaaaatgat tttttctctt aatatccctt aatgatcaac 18660
 ctatatattta cctacttaaa attattagca aatagttart ttaaaagrat gagtataatg 18720
 accaaaagca actctcatat ttaccacaaa gaaggaaacca ctaccaagaa tagtataatg 18780
 gtaattctgt tcttaacaga caggtgttgt gtattctggc atgtttacatg aaaaactact 18840
 atgagaagaa cagaaaataaa aattagaagg tagttttcac tatggaataa ggtaaagtatg 18900
 taagcagatt ttcttcacac atgaatttgt cagcagacct aataatccac ctgaaggggc 18960
 tcattctgga tgccgacatt ctctatgatg gaaaaggact gaaagttaaa tgacataatg 19020
 acataaagaa accaataatc aatagttaag ttgaagaatt aaacattctt tggacaggaa 19080
 cttaagtcaa gtttgcacat accaagaatg tatattgcca cgactaaatt aggaataatg 19140
 agcccatgtc acccaattgaa aatgtggagg actgaaatca atcatataag cagcagcaag 19200
 gtcttaacta tctcaaggtat taggtctacct ctggcgatata ttatccagat tgacaaattc 19260
 tccaagaaat tctaactata actgttaactgt gaggctcctt aaaaaataat ataaaccagg 19320
 cagtagactt acattttgta atattttctt ctaagagctg tacatlaaga ttttttttgt 19380
 gatataaata ctatacaata attagctata gaacagctct attttcaaca gttataaact 19440
 tttaaagcat ctcaacttta acctaaactt ttatcaaatg tcaaaaactga gcccgggtac 19500
 gttggctaac acctgtagtc ccagcacttt gggaggccaa gatgggcgga tcaactgagc 19560
 ccaggaaatc gagaccaaacc tgggcaaacat tggtaaaccc catctctata aaaaatacaa 19620
 aaattagctg cgcctggctg tgtgcgcctg tagtcccagc tactagaagc gctgagggag 19680
 ggaatccacc agggcctggg agatcaaaag agacccctgt tcagtagagc tgcagtctg 19740
 ccacccctggg tgacagagtg agacccctgt tcacaaaaaa aaaaaaaaag aaagaaagaa 19800
 aaaaaattca aaaaactgca cttgaggtcc aacttatgtt tactatactt cttataattc 19860
 ccaagagcat cttaaggaga gatgaaatca taaaaaggat aggatagaa agaaaatagt 19920
 ccaagctaaa ggtcaatttt tacatatatt aggctagatt aataaaaaat tgaagtgtct 19980
 attattattt ttattttgga cagagtcttg ctctgttgcc caggtcgga gtcagtgtgt 20040
 caatcaggtc ttaactgcaat gtctgccttc caggttcaag caatctctgt gctcagcct 20100
 cctgagtagc tgggattaca ggtgtgcctc acocctgccca gctaattttt gtaatttcca 20160
 tagacacagg gtttccaccac gtttaaaccaat gaggttgtggc aggtatggct caaactccga 20220
 agagtctagg attacatgag tgagccactg cgtctggcctt aaagtgtctt attataacca 20280
 aagatttatt tgtggagaga ggttaagaaa actcaatttt agtgaaaata taaaactgac 20340
 atcattcaca atctatctt caaaatgagg tattaactat ttggctctct aaaaattacc 20400
 tcatatactc atgcatagac atgggaattg aagttatttt attcctaagt ttagacttc 20460

atgttttaaa gtgatcacta aaaatttctt aattgatgat taggaaaaa actttctgta 20520
 aaattccaga atttttagctg ttccaattctc ttccatttaa ggggagaaaca ttattgtttt 20580
 accttctctg catcgacttt ctattattaga agaaaaatgga ctgaggggcag taagcaaccg 20640
 aaaaggaaga gtaataaagaa gcctgatgtg tgtgaaaact ggagaacagt ctcaaatcat 20700
 aaaaagttaa gcacagaagag gcataaaaaa taaaagttaat gaacttaata tatgaaaggt 20760
 aataatgatt aagagcctag gctataaagc cagactggac tccctggatt caaatctctg 20820
 ctcttctaat tactaggttag gtaaacctga gcaagtttca atgaccaatc tttttctcaa 20880
 tactctcagg tatataaagg ggacagtaac agcattttaa ccagaggaca ataaggata 20940
 aataaataca tgtaaaaat ttaaaaacag taacctggtat tcaataaagc gtaataaggt 21000
 tagctgctta tttattttca tctaaacttt accttctta ccagcaaatat tttttaactt 21060
 taaaaattt gaataaaaa atgacctagc ttagttaata aattcataat gagaaaaagt 21120
 gtttttcoatt taataataaac tttagtagtt tgggataaaca ctctgcatat ttttaatttc 21180
 ccagctataaa ataaactcaaa taatttgcga tcagatgac ttgtattttg aagttaacaa 21240
 ataaagcatt tcttaaaaaa gttctaatatc ataaactttg ctctcaactt atgttttaaa 21300
 aacaaatgg caaatcatct gcatcaaatat gctctactc ttataacatg acaattgttt 21360
 taaaaatat ctgtctggaaa aagcaactga agtcttagaa atagaaaatg taattttaaa 21420
 ctatttccaat aaagctggag gaggaagggg aaaaacatat ctggcaaaaat agctttataat 21480
 taattagttgt ttccagtttt caaaaaatcca cataggaaagc aatttaagcc taatttgctc 21540
 aagcttcaat ctccagcttag tagatagcct agggcaatca aaacttgctg ttttggtgctg 21600
 cccctcacag gactcaattt acctatttct tttaaaaagt gtgtaagtag gaattattgat 21660
 tcaagtttcta cattaaacaat attaatgcta aagcagatga ttatcattca cgcattcaat 21720
 atagaggaaa acagttctctg agaaccatct atagagatac agagagaaat gaacaaatcc 21780
 ttgtccttga ggaatttaata gtttactgct tacagagaaa ctacatacat ggtgaatat 21840
 ttaaaaatag ctctgatgat ctctatgtat attatgtttg ctatagaaaa agaaccaaggc 21900
 gaagattcta agatccaagt tctactgttg gctctgcatc caaaccaatca gctaaacaat 21960
 gtcaagtga gttttgggga agctgtctta tccccaaaat gaggggttta aattagttaa 22020
 tctctccagc ctctattgctt ctaattattcc acagttaaat ttgtcaaaac aaaaagctga 22080
 aggaatattt tcaaaaacag actctgcaga aagaacattc atatgatatt agaggctggtg 22140
 gcatattgta agaaatcaag gaagacttct tgagggaagg gacatctgaa gtaaccttag 22200
 aagcaccttg ggagccaagg ctattcccag gagttaacag agtcagataa taaaagatca 22260
 aagattttaa ggggaatagc atgcagtgtt atttgggtgc agtctagcta tatttttaga 22320
 aacatcaaat taatatcagt ataaaactca acagaatgga gggagaaaaa gcaggtagaa 22380
 aaattctaaga accactaaaa tagttcaatc agaagataaa ggaccataga gctaaatcag 22440
 tgcattgtgc aagaagggaa taaatgaaga cagttctggt ccattagaag tgaactcaa 22500
 caaaagtgt caaaagagtt attccaaagt attgacctgg taacttgaag aaaagttaa 22560
 aaagagaaa ctggacactt aaacagaaga agtagattat gttttggaa gtgaattgaa 22620
 gttagttgtt gggaccagtt agaacctcac agagaagaac tatgttaaga ccagaataat 22680
 ggccaggtgc ggtgctctat gcctgtaatc ccagcacttt gggaggctgg ggtggcgga 22740
 tccactggag tcaggagttc aagaccagcc tgacaaaagt ggagaaaccc tgtctccctc 22800
 gtctgtacta atacaaaatt agccaggtgt ggtggtgcat gcctgttaat ccagctactc 22860
 agggagctga ggttaggagaa tcgcttgaac ccgggagcgg gagggttgca tgagctgaga 22920
 tgcgcaatct gactctcagg ctgggcaaaa agagcgaaac ttctgtctca aaaaacaaac 22980
 aaaaacaaa caacaaaaac cagaaataca tcaattaaaa aagttagcta ttccagagt 23040
 attgttccat ggtcataaaa caaaaagata caggaggcat gacaagccat catcattgt 23100
 gtttaaaata ctccagacaa aattataatg atttaagtca ataacatcta ataatccag 23160
 ctaggtgtgc caattttaat tatattgtgc attataaaat ggagggccag aggtattacc 23220
 tctaattttc acaataaacc tattttagc attataaaat aggtctgctt aatcaataac 23280
 tgaacagacc aaactcaacta gttacctgga atataaactc agaactgctt aatcaataac 23340
 ctctcaatct taaccacatg ctatactgac gcatgtcaaa gattcaattc attcagatt 23400
 tccaaggtta tcgggaaaacc tatgtagata aaaaatttca caatttcaaa ggaattgaa 23460
 cttttacaga aagcatacac tgatcatcta ttgcaatact catgttctta agcaatatac 23520
 tgagttgaaa ttttttattt ttataataaa ttgaaagaaa tacatttttt aaaaacttta 23580
 aaaaacacct agtttttatt ctcttcccca aatttcaaca aattccattt attccaactt 23640
 gagggtgaaat cattaaagtgt gtgatattcat cagtaataagc agagttagga cctctgaat 23700
 actctctccc ataaaagcaa caagaacaca aaaaattcca aatagactt ttctggaat 23760
 ctttcaaaag ccccactctc agaaaaactgt cattatttga tctgcaggtt cctcagaaaa 23820
 acctccctca taggcattta ttgacttga ctacagagct actcagtga acaatttta 23880
 tcaccaggag agtttgtgga aaatcagtg caattgttaa acatcacatc tgccatgaga 23940

tagcaataaac	agatggggaca	aacaagcttaa	ccaaaaaatt	aaagaaaaaa	cttggggaat	24000
aagaataatcca	aaggggggtct	gaaaagtctt	aacatatttc	tgataatcca	gaagagccata	24060
cacatgtata	gagctgtgta	cagctctaaa	aaacatctac	gaaggccctac	aactctcaccc	24120
tatgggaaac	ctcagggtctc	tgtacaaaga	gaaagtaaaa	tcagttata	aattgctctg	24180
cgtatcattg	agggcaatgc	cccaacattc	acacataggc	cctcggcaaa	gattggaaag	24240
tactctcagt	ctagggtctc	aagaaaaatc	cttctaatac	tcagatgac	actaaactca	24300
ccaagcagta	acttttagggg	ctcgtgtgat	aaaaataaaa	aacctgaaag	aattagtcca	24360
ggaaagaaac	taaaacaagca	acagcaacaa	caaaaaacaga	ccttgggaaa	gggggggaag	24420
atctcgtttc	cagagtttatt	ctgtttatac	atataaaaata	ttcaggtctc	aaacaacaca	24480
aaattcacaa	gacatgcaaa	gaaacaagta	taagccacaa	actcggggga	aaaagcagca	24540
gaactcggcc	ctgaaaaaga	ccagatgctg	gacttactgg	acaagacttc	taagagagtt	24600
attttaaata	tgcgcaaaaga	actaaaaaaa	agtttatcta	aagaactaca	ggaaagcttc	24660
agaacaatat	ttctgatcct	tcagaagaac	cactttttgt	cactacagat	tagttctctc	24720
tggtctagaa	ctctttaaata	acagaatcat	agagtatat	ctctttatat	cagctctctc	24780
tactcaacac	aatgttgtgt	gagattttac	catgttgttg	catgtatcat	tcocaaacag	24840
aaatagaaat	tatagagata	aataggagtt	acaaaaaagt	cccaaaacaa	aattctggag	24900
ttgaaaaagca	caaaaactga	attaaactga	gggggtcaac	agctgatttg	ggcagccaga	24960
agaatgaatc	agcaaatctc	aaagtaggct	aatttgcaga	aagagaggga	agaaggaagg	25020
agggaaggaa	aggaggtctc	gagaccaca	agacaccatt	aggtacacca	attatcacat	25080
aatgagaggc	ccagaagaat	atgcagaaaa	agggtcagag	tacttgaaaa	aataatggcc	25140
ctaaactctc	gcaactttgac	cccaaaaatt	aatctacata	tcocaaagaa	taaacaaact	25200
aaaaagaaat	aaatcaaaag	gatccacacc	taggtacatc	ataactcttc	agactaaata	25260
taaaagagaga	ctctcaaaaac	aggcagaagg	cttatgtaca	aaacatcttc	tgaatcaaac	25320
caaatctctc	atcagaaatg	atgtttgcac	taggcaatca	gatgacata	acaaagcacc	25380
gaagaagaat	gaatgtctcg	gacctggaat	gctggtggac	acctgtaatc	tcagttattc	25440
gggtggccca	gggtggggaga	tcacttgagg	caaggagttg	aagaccagcc	ttggcagacc	25500
aaagagggcc	tgctctcaga	aagaataaaa	agatgtggct	aatgtggctg	tgctggacctg	25560
tagtccacag	tactcagctg	gctaagttgg	aaagatctgc	tgagccagctg	agttggagctg	25620
tgcaagtgcg	tatgactgtg	ccaactgcact	cttgcaagtgc	agaccctgtc	tcataaagaa	25680
aaaaatgtct	accaaaaact	acatgcagaa	aaactgcact	tcagaaaatg	atcagtaacc	25740
tgaaagtctg	aaggtgctta	agactgtaga	tcaataaccat	agaaaaata	ttagttatca	25800
ggaaatgtaag	aaaatttaaga	cagccttgtt	tgataactac	acataaactc	gtaactcttc	25860
ttgcacttgt	ctgtgttatg	tcaagctatg	agcacaaact	gatgactgaa	atcagaaatc	25920
cagaacagga	tataaaaact	tatcaggtaa	agttaggcaa	gcaattacta	gttgaatcta	25980
aacttgaagg	agaaggaata	aggaaccaac	tcaaacccag	cagcaatgaa	ttgtaaaaaa	26040
gcttaaggta	aaacaaaacag	ggaaataaaa	caactcagaa	cctaagcata	tcgtaaagaa	26100
ctaactcaac	aaggaggggc	ttaaactgat	tattttacag	cttgggtgca	attatcccaa	26160
aaaaaacttt	caggaggttc	accagtccat	aaactatttg	gttatagaaa	aatagcttta	26220
ttgggctacc	ctctttgggt	ccccctccct	tgatatggag	ctctgttttc	acctctataa	26280
atcttgcac	tgcaactctc	tggttcogtg	ttgttacggc	ctcagctcag	ttctcaactc	26340
ccatccacca	ctcgtgtgtg	cgcccatcgc	aggcctgcca	ctgacttcca	tcctcttgga	26400
ctcagcagg	gtccgtgttg	gctcctgac	cagtgagacg	ccatttgccg	atcccgactg	26460
ggctaaagac	ttgcactgtc	tctcaagcgg	ctaagtgcgc	gggttcatcc	taattgagct	26520
gaacactagt	cactgggttc	cacggttctc	tctctgacc	cttggtctct	aatagagcta	26580
tacaactcac	cgctggccct	aaagttccat	tatttggaat	ccatgagccc	aagaaaccca	26640
gttcagagaa	cacagagctc	gccatcatc	tagaagcagc	ccggcaacct	ctcggagtt	26700
ctggggagcaa	ggaccctcgt	gtaacaaatt	ggcgaccaca	aagggaacct	aaaccccaac	26760
catgaaaggga	tctccaaaag	ggttaatatg	gaccactttt	ctgtgctact	cgctccctac	26820
ctttagaatt	tagagcaaaa	actggggacc	tgctggccgg	ttaaaaacga	ttagcatggc	26880
cgccagactt	tgactcagg	tatgaggtca	ctcggggaa	ggctttctca	caaccctcaa	26940
ccctctcgg	ttgggaacct	tggtctgcct	ggagccagct	tccactttca	attttctcgt	27000
ggagcccaag	gctgactag	aggcagaaa	ctgtcgtccc	gaactccggc	gactccggc	27060
ttgagatcat	gtcgcaagcca	gaagtctcta	ctcaacagtc	gcccatggct	ggctctctac	27120
cttccctctt	ctcccaagcc	tctcgggtcc	caaccacgac	ttcttggaag	tgctcagccc	27180
aaaattctcc	ttactctcta	atctacttcc	tctgatccct	gctcctcagg	tactaatggt	27240
tgagactttc	tctctctcta	gcaagtttga	tctccaaaag	gactcaagga	agctctatgc	27300
tgccgcccta	ggcatctagg	ctataaacca	agggagttct	gtccctgggt	tcctctctga	27360
tttaggtata	cagctctaga	catggggcag	tatgtgggac	ctgttcccca	ccacccttgc	27420

09719554-011801

caggggcccc agtttgttaa tggctaagag aggaacacaga gagagacaga gagaagagag 27480
 cagtgagaga cagacagaga cagagagaga gagagacaga gagagagag agagagagac 27540
 ggagggacagg gagagagaga gagagagaga gagagagaga aagaggagaga aagaggagaga 27600
 gagcaaacaca gggagctcaga gaaagaaaga caaagataga aatagtaaaa aaaaacagtg 27660
 tgcctatttc ctttaaaagc cagggttaaat gtaaaaccta taattgataa ttgaaggtct 27720
 ctctccgcagc cctataaacac tccaatacta ccttgttgtc agcgttaaaa tggcgtatgc 27780
 ctgaaaaacac taagacacac gacaaacctc agccttctca tcaaaaatcc ttaacctcca 27840
 gtgactctgc gatggcccaa atgcattcaa tctgtagcgg caactgcttt gctaacacaga 27900
 aaaaagttaga aagtaacttt tagaggaaac ctcatgtgga gcaacacctc ccggttcaga 27960
 attattctaa gtcaaaaaag caaaaaggta gcttattaac tcaaaaatat taaagtatgc 28020
 tgcctatttc tcaaaaaaag gtaatttaac actaacacct gataattccc ttaacgtctc 28080
 agattctctt acaggggatt taaattctaa ttaccatata aaggtccgac cagaccctag 28140
 aggaactccc ttcaggacag gatgatagat ggttctctcc aaatgactga ggaaaaaacc 28200
 acaatgggta ttcagtaatt gatagggaga ctctgttgga agcagagtta gaaaaattgc 28260
 ctaataattg gtctctctaa atgtcagagc tgtttgcact cagccaagcc ttaacgtact 28320
 tacccaatca aaaagactat ctcaatctgc actcaaaagc ttacttatac cctctctgaa 28380
 acgaatttgc ctaagaactg ttgtttatgg gaatgcact tgtaggagca gctgggtctg 28440
 ttatgaaata tcaggaaact agcctagctc taggactcac cctcgagcac aagggcaatg 28500
 ttgggcaagc tggtaaaagc ccactagaat ccagcagccc ggaacctctt ctctgtatgc 28560
 aaaaagagcg ggaagagggg tggaggtctc tacatcagtg agcataacta atccagataag 28620
 cagaggtcca tgggtgtgta cacacccccc aaagaaataa gcttaggagc catcgagtag 28680
 gctctaggac taatgctcat cggaataatga ctagtgtgc tggcactccc atgttctctt 28740
 ttcagataga aagcgtctcc ctcaaggcaa aaacacctcc aagatgtatt ctggagaact 28800
 gggaccaaht tgaactctag atgtctaaga aaaaaagaca tatctcttcg cagtaacctc 28860
 ttgcacagc atactcttta aggggggaga accctggcat ctgagggagc catataacta 28920
 aacacatctt tacagctaga cctcttttgt agaaaagag gcaaatgtgt tgaagtgtca 28980
 tacgtacaaa ctttcttttc attaagagaa aactgcgaat ttgtaaaaa gtgtcatttt 29040
 tgcctacag gaagccctca gactctacct ccctacccca gactccccca gactcatttc 29100
 ccaaaaataa aggaaccccc ttcaacccaa acggtccaaa aggagataga caaagggtta 29160
 aacaactaac caaagaatgc caatttccc cgattatgcc cctccaaagc gttgggagga 29220
 gaattcggcc cagccagagt gcaactacct ttttctctct cagactttta atataaattg 29280
 acctaggtaa attctcagat aacctataat gctataatga tgtttacaa ggttaggac 29340
 aatcctttga tctgatattg agagatataa tgttactctg aaatcagaca ctaaccccaa 29400
 atgacagaag tgtcgcctga actgcagcct gagagtgttg cgaactcttg taatctagtc 29460
 aggtcaatga taggtcgaca acagaggaaa gagaacgatt ccccaacagg cagcaggcag 29520
 ttcccagtg atccactcac tgggacacag aatcagaaca ttggagattg tggcgcagac 29580
 atttgcataa ttgcgtgcta gaaggactaa ggaaaactag aaagaagcct gtgagttat 29640
 caatgatgtc cactataaca cagggaaaag aagaataatc taccgcttt ctggagtact 29700
 taacggagtc attgaggaag catacctctc tctgtcaact gactctactg aaggccaaact 29760
 aatcttaag gataaggtta tcaactcagc actcagacac attaggaaaa acttcaaaa 29820
 gtctgcctta ggcccggaac aaaacttga aacctattg aacttgccaa cctcagtttt 29880
 ttataataga gatcaggatg agcaggcaga atgggacaaa aaaaagccac 29940
 cgctttatgc atggccctca ggcaagcgga ccttgaggcg actggaaaaa ggaagagcta 30000
 gcaaatcaa atgcctaata agccgcccc ctagtcgggt ctacaaggac acttaaaaa 30060
 agatttgtca aatagaaaat agccgcccc tctgtcctag ctccgtctg aagggaatca 30120
 ctgtaaggcc cactgcocca ggggacgtag gtctctgag tcaagaagca taacacagat 30180
 gatccagcag caggactgag atgtcccggt gcaagcacca gcccatgcc taccctcac 30240
 agagcctctg gtatcgttga ccatgtacg ccaggaggct aactgtctcc ctagcactgc 30300
 tttgtgcctc tcaactttat tttcctgtcc cagacaaagg tctccagag ctgtcactat 30360
 ccaagggttc ctgagcagc cagtccactag atacttctcc cagccaactaa gtgtgtactg 30420
 gggaaactca cttctttcac atgtctttct aattattgct gaaagcccaa cctccttgtt 30480
 agggagagac attctacaa aagcaggggc cattatacac ctgaacatag gagaacaccc 30540
 gtttgtgttc cctctgttga ggaaggaatt aatcttgaag actgggcaac aggaagacaa 30600
 tatggagcag caaagatgac ccgtcctgtt caagttaaag tgcctccttt gctcctctt 30660
 cccacccaaa ggcaatcccc ccttagaccc gaggtcaac aaggactcca aagagttaag 30720
 gacccaataa cccaagcctc agtaaaagca tgcataagcc cctacaacta tcaacttta 30780
 ggaagtacaga aacccagtg acagtggag ttagtgcaag atctcagat tatcaatgag 30840
 gtcaactgtc cttataact agctgtacct aaccttata ttctgtttc ccaaatacca 30900

gaggaagcag agtgggttac agacctggac cttaggatg cctttttctg catccctgta 30960
 catcccgact cctcaattct atttgccttt gaagatcctt caaacccaat gtctccaactc 31020
 acctggactg ttccaccccc aggggttcagg gatagcccc atctatttgg ccaggcatta 31080
 gcccaagact tgagcgcggt ctccatccctg ggcactcttg tcttttggtg tgtggatgat 31140
 ttttactttt agccgcagct tcagaaacct agtcacccaa agtcacccaa gtgctcttaa 31200
 attttctcgc taactgtggc tacaaggttt ccaaacccaa ggctcagctc tgcctcaagc 31260
 aggttaataa cttagggcta aaattatcca aaggccacag ggcctcagt gctctatctg 31320
 gcttatcccc atcccaaaaac cctaaagcaa ctaaggagat tctttgacat acagagtttc 31380
 tgccaaatrt ggattccagc gtacggcgaa atagccagc cattatatac actaattaag 31440
 gaaactcaga aagccaatac ccatttagta agatggacac ctgaagcaga agcggcttct 31500
 cagccctcaa agaaagccct aacccaagcc ccagtgttta gcttgccaa ggggcaagac 31560
 ttttctttac atgtcacaga aaaaaacaga aatagctcta ggagtcttta cacagctcga 31620
 tgagcttgca acccatggca taccgtagta aggaattga tgtagtggca aaggggtcgc 31680
 ctcatgtttt atgggttagtg gcggcagtag cagctcttag atctgaagca gttaaaataa 31740
 tacaaggaag agatctgtgt agacatctca taacgtgaac ggcatactca ctgctaaaag 31800
 agactctgtg ctgtcacaga accgtgagga aagtaactaa aatcgtataa ccccatggcc 31860
 ctcccttctc atattttctt ctttactgtt ctcttaccct ttttcaact cactgcaacc 31920
 cctccatgct gctgtacaaac cagcagctcc ccttaccga agttttctat aagaattcgg 31980
 ctctccagaa atattgtatg ccttcaaaat agggctttac cttaaaggaa cctcaacttc 32040
 actgcccaca cccatattgcc ccaacaactgc tataactctg ccaactcttg catgcatgca 32100
 aatacttatt attggacagg gaaaatgatt aatccttagt gcttggaaag actgtgaagc 32160
 aggtgtctgt ggaacttact caccataact ggtatgtctg aggggggttg agttcaagat 32220
 caggccaagc aaaaacatgt aaaggaagta accctccaa cctcccggtt acatagcacc 32280
 cctagccctt acaaggact agatctctta aaactacat aaaccctgg taccataact 32340
 tgccttgtaa gctatttaa taccaccttc actgggcttc atgaggtctc gggccaaaac 32400
 cctactaacct gtggatgtg cctccctctg talttcaggc catgcatctc aacccctgta 32460
 cctgaacaaat ggaacaaact cagcacagaa ataaacacca cctccgtttt agtagaacct 32520
 ctgttttcca atctggaaat aacccaatcc cctgtgtaaa atttagcaat 32580
 actgtagaca caaccaactc ccaatgcatc aggtgggtta cctctccacc acgaatagtc 32640
 tgcctacccct caggaataat ttttgtctgt ggtaccttag cctatcgttg tttgaatggc 32700
 tcttcagaat ctatgtgctt cctctcattc ttatgctccc catgaccatt tacactgaac 32760
 aagatttata caattatgtt gtacctaaag ccacaacaa aagagtactc attcttctt 32820
 ttgtttcggc agcagagtg cttagtggac taggttcttg cattggcggg acccaaacct 32880
 ctactcagtt ctactcaaaa ctactcaag aactcaatgg tgacatggaa acctccttg 32940
 actccctggt caccctgcga gatcaactta acttctagc atcagtatgc ctctcaaaat 33000
 gaagagcttt agactcgtc accctctga aagggggaag ctgtttattt ttaggggagc 33060
 aatgttgtaa ttaatgtatt tttagcggaag aatgttgtaa ttatgttaat caatcccgaa 33120
 ttgtcacaga gaaagtga aaaaattcgag attgaataca acgtagaaca gaggagcttc 33180
 aaaaaaccca gaccctgggg cctcctcagc caatggatgc cctggaattc ccccttctta 33240
 ggatctctag cagctctaat attgatactc ctctttggac ctgtatattt taacctcttt 33300
 ttgaagtgtg tctcttccag aatcaaaagt gtaaacgtac aaatcgtctt tcaaatggaa 33360
 cccagataga agtccatgac taagatctac cgtggacccc tggaccggcc tactagccca 33420
 tgcctcaatt gtaatgatat cgaacgcacc cctcccgagg aaactcaac tgcaacaccc 33480
 ctactatgcc ccaattccgc aggaagcagt tagactgttc ctgacccaac ctcccacaa 33540
 gcacttggtt tttcctgttg agtgggggga ctgagagaca ggattagctg tatttcttag 33600
 gccagtaag aatcccaaac cctagctggg aaggtgaacca catccaactt taacactctg 33660
 cgttgcaact tagctcacac ccgaaccaat aggtagttaa gagagctcac taaaatgcta 33720
 attagacaaa aacagagagt aaaaaaatag coaatctatc atcgctcagt agcacagctg 33780
 gaaggacaat gatcgggata taaacccagg caatcaagcc ggcaaccgct accttcttg 33840
 ggtccctccc ctttgtatgg gagctctctc tgtcttcaat tcttaataa ttgaoacttc 33900
 aaaaaaaaac tagcttaatt gaagaaataa ttaatacaat aaaaggaata actttaaagt 33960
 aatacgttca aactgtcaaa gtgttacaat tccaagaga cccctcaac aagattatgg 34020
 gcaatttccat tgacccctaa aagttctctc ttgtccctta ctggttgggt ccatctcttc 34080
 tacacctctc tgactctggc cagaccttgg cctccagaaga atcatttttt tgcactaca 34140
 tattagtttt gctcgttcta gaacttctta aaaaacagaat catagagat gttctctttg 34200
 tattggtttt ttttactcaa tgtaatgttc tgtgacattt atccatatta tgcagatgat 34260
 tattctttt aatccctgaat agtatgtagt ttttagaata taatgcaatt gttattcat 34320
 ttacctgttg acagatatct gagctattat gatggatatt atgaataaatt ctgctatgaa 34380

cactctctgta caatgttttc tgggacatat attttccattt ttcttgagtg gagctgttag 34440
 aactgtttgga tcgaaagata agcatatgtt gaattttgaa agaaactggt aaactctgtg 34500
 ctaaaagtgt ttgtacactt ttacactcct actaataatg tatgagaagt atatttggct 34560
 cacagcgtctt ttactacttt gttaactctt tttagtactgt caaccttttt aatttatcca 34620
 atctagggaa cgtgaagtag tatctcactg ttatttccat ttctcgtatg agtaacaata 34680
 tcgtgtatct ttcatgtgct ttatragcca ttccctatct ttttgtgaaa tagtttaact 34740
 aaatttgttaa ctaaaagtcg ttccctgagt ttccaggtagt aagcctattt ttgtataagt 34800
 aataaactac agtccttgaa tgaaaaatta aacacagttg agcatttttt ttgtataagt 34860
 gttttactct gtgtatgtct ggtttgctta gtctattatt atgtcccca atgtacatac 34920
 cacagtgact atttactaa tgagtatcac tagcacatag aactgtgctt gcccaaaagca 34980
 tgaactcgtt aaatatgtta atgtgtatgc atgcacatgc atctacatgc atgtacatct 35040
 atcacacatc ataaacatat attaattttt agaccacaaa acttaagaaa actaatctct 35100
 gagcctctgg ttggaagaat tctcaaatla ttaacatatc tttatgttcc accccaacatc 35160
 cactgtacct gaaatagccc tactgttcta ctttggtaaa tcaggcgaat ttaatttttt 35220
 aaataattaa gattccaaat aattttaaaa tataatttga agttaaaca tgaaatcacat 35280
 tacataaaaa gaaaatttta aataaaagca aaactaaacc caataagagg aaagaaggt 35340
 gggctgtatt tctttaatcc tttaaaattc aaatcacaca atgctccaat gaaattctta 35400
 ttaactgtat caaactatgc ccatgaagaa tctcatatgc aactgtcaaa accccaataa 35460
 acatatctat cttcttgcaa aaaaatattt tctttataat atgcacatgc agtatatac 35520
 attttgaggc agatttgtac tttagtctct gtctcatgct ttaccggctg cgtcgtctct 35580
 ttctggtcat tgacctccaa ctttaaaaaat aatacttgcc ttgtctacc ccagagaagt 35640
 gtatgaaggt caacaagaat agcataaagg tattttgaac gctataaagt gcataaagt 35700
 agattttaa aacactctca catcccataa tactttgttg tacaatttta gagcaatagt 35760
 agaaaaatac aattattgct taattgaaa tccagctccg aattccataa aatgttatgt 35820
 atgacattca tagtatcata tattacagag cccaaataat cactgtctat atagtgtgt 35880
 aggtttctct tagttgtct atatatgtta tatatttact cagtcctcat ttctgtgagag 35940
 gcaattgtgag gacataaagg acataagcac agtacagagc cttagctctc atacatttca 36000
 taaagaagag tctctttggg gattttaatc aatatttaaa gtattctggg agaaattgaa 36060
 attacttca tactactgac tttagattact atcatttaaa aaagatgcct gagtgatctg 36120
 tcttaacat acagattatt atcttataac tgttataatt acttgaatca gaagtgaagt 36180
 ccttttaagc actaagcatc cattctatac ttctgtgtct ttacatatga gatcaaaatc 36240
 atatttttaa aacttttatt tacttttatt ttttagagac ggagtcttgc ttgtgggcc 36300
 aggtcggagt acagtggcat gatcttggtc caccacaact tccacttcca cttccagggt 36360
 ttcaagtga tcaatcatac ttttaagcac agattctcaa catgtatctc agcatgtctc 36420
 tgcataaact aggggttgaa ttaagtatta aagacagctt accccaataa ttactgtaac 36480
 atatatctct aaatgaaaaa gaacatatta acaactcata ttggatggga ttgtggggc 36540
 taacccatcc cctctccccc ttctctccaa atctcatctc ctattaaac accagctctc 36600
 ctgagctaa cagctctggt ggttggggaa ggtgtgtac ttggatggga agaaactctc 36660
 cgtgtgtttc ctctctggga ggaactagca ggcatacgaa cagaaaaagct tgaataaaag 36720
 catgtaactc ttctattcct gaggcagaca gagagaagac cagggaacaa agacactctc 36780
 accaagagcc ctgccaggta ttgtacctt tgatactgag aaaaatctcg ggtatgaaa 36840
 tacaatgctt aaataagctt ctttgaata ggggtcaaaagt aataaaggtt cttgatgagt 36900
 aaaaagggtt gtatttttta ataacctgat aatgagcttt agaaaaaggg aaggctcaagc 36960
 ttatggaaat aaacacaga ggtaccaaat ttaaaaagggt aaaaaaagggt gggggggggg 37020
 aacccaatac ctctcatcaa ctgacaaata acttagtata atttctaatt agaaacgcta 37080
 gaaggaatac acttagatct gataaaagct aggcctataat tctataactt gaaacactta 37140
 aactgtatca attaatacca gaaaacaaac acagaaaaagt ctactagaac catcattatt 37200
 cagcacagtc ttgttaatgc aataactata tagcataatg atgacacaa agtaaaaaaa 37260
 gtttgtaaaa accaactagg atgagatttt tgtttttcca atgccataaa taactagaaa 37320
 tggaaaacaaa aaaaagaaa acaaaactta gaaaacacct ggaaataaaa agaaataagg 37380
 tctatttgaa gaaaacctta aaatctatgc agaactataa acaaaactgt aataaaaaa 37440
 aatatcatgt tcttgtctgg gaagacttaa tatcaaaaga aagtgaatta tatcaaaatt 37500
 taaaatcgaa ttttaagtat ttccatctct aatcagacag gacactatgt ggaactgat 37560
 aagtgatttt aaagactcat gaaaattaat aactgagaat aacctgaaa agtatgaaa 37620
 aaggagacaa atgaattgt ccacagata tcagaaacgt aaaaataact aaaaataact 37680
 ctaggataag aaatatcata tactgatgta atgaataaag aatccagaat tagattccag 37740
 taggtcaaac taactttaact taacacaggg gtggcatatt catccaggtg gaaaaggaca 37800
 gtaagaagtg agtaaaactat ggcccactgg ccaaatttgt gctctgtcct atttttgaa 37860

ataaagtgttt actggggacaa agccaaagcct atcattttgca aattgtcttat aatatattttc 37920
 atgtttacaga atcacacagat ttcaacacagat accatcttgt ctacaagaagt gaaaaatattc 37980
 actatctggc ccttgaagaa agtttgcmaa acccttagtt atataataaa agatccagcta 38040
 tctcatagac accatactca cacaacacat tctgggaaag gacctctttt tttttttgag 38100
 acggggtcttt gctctgttga ccaggcttga ctgtagtctg atgatcaagg ctacactgag 38160
 ccttcaaccrc ccagggttcaa gtaatgtccc caccacagaa tcccaaacag ctggggagaga 38220
 ttgtgtgccac tacgctcgtg taaggggcct ttttaacaga gaaagaaatc cacatactac 38280
 taagaaaaag aagggcctat ttgtatatata tttatatatt ttatatagat atcataaaaa 38340
 tcaagatgaa ttatcagatt atatttttga atgtgtttga cgttaaaagt tttaattcta 38400
 taataaattat tttataaaat atctttaata tattttataga tattataata taaaatattc 38460
 ataaaattat tttataaaat aaaaagttaa gaagaaaaga taggcaaaac aaatacagct 38520
 gcaatttaca gaaaaccaag tccaaatggg caacaaagat aaacagatt tataaactca 38580
 ctaagtgtga gagaattatt agttaaaata aaaatatctc tctataccca caatactact 38640
 aaaaactcaga gttataatgc cctatttgtg gtggagatgt aagggggaga gcatgctctc 38700
 atatactgtt agtgaataatt taaactaata catttttgaa aagttaagctg gcaatttttt 38760
 ttttaacttc taccttttga tgcataaaat catttttggg tacctatttc ataccttaaa 38820
 aaaaatacat atgctttact tagtactgtt tataaagtta aaaaactaga aaaaagaaaa 38880
 cttgatagat aatactgaac aaattacagt gcatctacag attaaacata atgcagcct 38940
 ttcaaaaagaa taaattaggc tgggtgcggt ggcctatgcc cgttaatccc gcaatttggg 39000
 aggcacaaagc agggcggtca cctgaggcca aaatacaaaa ttactgtggc atggtgtgtg gcacctgtag 39060
 aaaaacctgg cctcacaaaa aatacaaaaa ttactgtggc atggtgtgtg gcacctgtag 39120
 tcccagctac tcaggagtag gaggcaggag cagcattcca gtcccaggtg cagaacagaga cctctgtctca 39180
 agtgaagcaca gatcatggca cctcaactc agacatttct tcaagatgta taaacaaaga cttgaaaga 39240
 acaaaagaagaa caaatttaaac agacatttct tgaattacat ccaactagat taggtatggt atgtataaga 39300
 atgtgggcaaa ggaattgaat tgattacat ctactacgga gaaacacaga aaccttttgt cactgttgtt 39360
 acagaaaaata ataatatttt gtgaagatct ctactacgga gaaacacaga aaccttttgt cactgttgtt 39420
 gggaaagttaa agtgggtacag ctactacgga gaaacacaga aaccttttgt cactgttgtt 39480
 aaataaaatt atcttatgat aggaatatgc atttctgggt aaatacccca aataaactgaa 39540
 aacagggtgt acacccattt caacattttac atgtcaattc aactggggcca gaataccag 39600
 atattttgtc aaatatctct ctggatgctt ctatatatat gttttttggc tggggttaac 39660
 attttaattg gtgattcttg agtacagcag attaccatcc acatgttagg tgggcctcat 39720
 ctactcagtt gaaggtctta cagaaaaaga ctgacctccc ttgagcaaga aagaattcag 39780
 ccaacagact gctttctggac tcaactgcga ctctctctg agtcaacagc agactccatc 39840
 accctggctt ggtgagttca ggtgtctgat aggttaggctg cagactcaag gaagagctgc 39900
 caaaacaggg aaagccaatt cattaaaata atctctctc tacacaaaca cactccatc 39960
 ctaccaccac caccatgat gtctgtttc tctggagaat gctaatacac cctgttcat 40020
 ggcagcatta tctacatag ccaaaaagggt taattaagct ttaaaaagtg gaattatatt 40080
 aaaattgtgt atgtatatac aaatgaaat acacacacac acatttatag aagagcgggt 40140
 ctatctatat ctatacacac atactcacac tcttgggctc aagcaaaccc cctgcctcag 40200
 ttccactagt tgtcaaggct ggtctcgaac tcttgggctc aagcaaaccc cctgcctcag 40260
 ctccccaag gtctgagatt acatgtgtga gccacacac ccagccaaata aaggcagatt 40320
 ctgacacata atcaaatata gataaaacat gaggacatca tgatatcgga aataagcctg 40380
 tcacaaaaag gcaattatgt tatgattctt ctgtatgag gtgctatgg atgtcaaatc 40440
 cataaagtag aatggggaaa cagagagttg ttttaagggt atagagtttt ttgttcaaga 40500
 agaaaagaggt tttgggaaa gaattgtacaa cagtgtgaac ataattaaac ctactgaaaa 40560
 tggtttaagt tataaatttt atgtttacatt tattttacca tgattaaaaa taaaaacaaa 40620
 ataataatga gtttgggaaa tatataaact aaacaacaaa aaaaacatct actgcaaaa 40680
 cattaccctg gaaaacagaa tacatctcat tctgttagag atatatctgc agttcaaat 40740
 ttattcaaaa tgaattgttg tatctttttg aaatgactga aaactaaat aggtcaaat 40800
 aatattcagt tcttaacca gtaagtcttt ctttcatggt tctgtacttt tctgttaagt 40860
 gtatttgcaa gatatctact aaaaatggaaa acaactgaaa aggcacaaat ataatcttt 40920
 ctcaaacctg ctcaaacctg ggaagggaag aatcctaaca aacatggcca taattttgca 40980
 catatttcta ctgtctcact ttttcaaaat cagagaaatca acattttcgg aaacacaaa 41040
 gagtctaaaaa tttgtgtctc tcttcagttt agaaggtggc aggttaactc ctgacattct 41100
 agtttccatt ttcacaaatg tacttttttt cttcccaaac cgttatctag atttcttca 41160
 ttttttagca catagaaatt aaatagattt gorttaacaaa aatagccagt aaacotcccc 41220
 aaagaatttaa aatatattat ggcgttttaat gatacaaatg aacaacttta cattcaatcg 41280

tcaatgggaa aggaagcaga attctgagga ttatgaaagt aaacaaaaacg aagtccaat 41400
 tctactttat ttactctttt tgttaactaat gaacaaactt tccaaaagac aagtaggaaa 41460
 tacaaaaatt agccagccat ggcacatgcc tctacttggg aggcctgaagt 41520
 gggtggatcg cttagagccgg gaagcgacag gctgtagtga gctgagatca catcaccgca 41580
 ctcaagcctg ggtgacagag caagaccctc tctggggaaa aaaaaaaa aaataggctg 41640
 ggcgcagtggt ctacactttg taattccagc actttggggg gctgaggcag gtgggtcacc 41700
 tgaggtcagg agttctagac cagcctgacc aatatgggtga aacccctgct ctacaaaaaa 41760
 tacaaaaatt agctggccat ggtgggtggc aattgtaact ctgactactc gggagcctga 41820
 gcagagaaaa tcgctggaac ccaagaggcg gagggttccg tgagccgaga tgcactagt 41880
 gcactccagc ctggcgacga gagcaagact tcatctcaaa ataaataaat aagttaagta 41940
 ataaaattaa aaaaatatata aaaaataaac aaagataagt aggaaccatc cttttttttt 42000
 tttttttttt ttttttttaa agatagggtc tgtttctgat gccacaggctt gagttagtg 42060
 gcatgatcat ggctcactgc aaccttgacc tctcaaatac aagtgtctct cctacctcag 42120
 cctcccaagt agctgggact acagggtgctt accaccccat ccggctcat taaaaaaat 42180
 tttttgtaga ggtgggtgtc cactatgttg tatccaggct ggtctcattt taactttat 42240
 agaaaaacaag cattgtttta tcaagcttctt gtttttttaa aactaaaaat aaacactgta 42300
 gggtgtttct atgaagattc tcaaaattta tctataacct taagaataac actgtagaac 42360
 aagtagatga ctgaatgact tttgttgat aaatatgaat ggaatttcaa ataatataaa 42420
 atctcttaag atctccactt ctttacagga tacagagaaa actcgttaat atggcctcag 42480
 ttttaccttt gcagccttat ccaaaacttg tctcaagacg aacacaggttg tctcttaact 42540
 taacacagttcc ccttttgctt acaaagctct tctcatgact ctctgctcat cttaagtct 42600
 cctatctgtc aaatctctgg gaatgcaaca tttcctcaag gtactgctct cctccctcaa 42660
 actagaacaa attctctctg gggcattagg tttttattgc actgtatgtc tcttcttacc 42720
 agcaatcaca gttccaatgt tatatttgta tttctagtgt atgtgtttct tctcaacttt 42780
 agactataac ctcttaagggt gtccacacata atatcgatca tcaagtgtat cctctgtgca 42840
 tagcacaggc gactggcagg aatatatgtt gtaaaataac ttgttgaatg aaatcaatga 42900
 cacacacttt cttaccctaaa gtataatggc aggaataaac ttatcaactt tttgtctct 42960
 gaaaaacaga tatgtatgtg ttaattttca ttttacatct caaatccaaa tgcctaaagg 43020
 attcacagtc attttacaaa tctttttgac aaatgctctc attaatcaac accgtgttcc 43080
 aagtgtctaa taacattttg gttacattct gtaacatttc ctgcacttaa tgtctatctc 43140
 agaatactgg ctaatatgaa gcaacctggc ttcaggaaac caaacctgaa actaacaac 43200
 caaaactaac tgtttatgaa atgacagaaa tgacacattt tggctcgaaa catctctaga 43260
 tggcttttgg accaatccaa cttttaccac taataaatcgg tcaactgact atagtcaatt 43320
 tgagctcatg ataaatgaat tacagatgaa aaataaatag ttgatgaca attttacaaa 43380
 aagttttact tcaaaagata ccaaccgtca caggtaattct aggtcctcat caacttaatt 43440
 gggtcaggga gacttcaact ttcatgataa ttgtctctc aaaattctac aaacttaagt 43500
 attacaaaaa aaagtcatag ttgtctcata aatcaggcct aggtctggat cttagtttt 43560
 ccatttttca tttgttcaact gaggcaagtg acttaaaatt ccttagcctt agtttctc 43620
 catgtaaaaa cagataatga ttcttatctc taagatggtt ttgagcgctt acaacagata 43680
 gatgggcctc actcagcat gctcagtaet ctctctctct ctctccggtt atgcagaaat 43740
 tctattagga ttctgaaa taaaataaat atttcagtaa aaatatgcc cttatttaat 43800
 gaatctagat ttccagattt tctttaaatt tacttagtaa cttagggct caaatattat 43860
 agagattact atctagattt ttaagaaat gaagaggtgt aatcaaaat ctgcacaaat 43920
 aaagtctaca tttaacaac agaataatcac aaccatacaa actaatcaga tataaaggag 43980
 ctgacaaacg aaatctgat ttgcttttag atccacaat taggcaaacg aaatatagat 44040
 tccatctctc ttgtgtcaag gccatggttg aagactgaat accaaatagg gaaataggaa 44100
 aagccagga atggcaaat agcaaaaact ggactcctta atttttatat ctattttcat 44160
 attcctactc taaaacttta attaaattca aaaaaaac aaatggagc tgagataaag 44220
 ccaaaaggaa agttatgag gtcaaatgag aacctatatt gtctctaggc tctttgttgc 44280
 tttctgttta aggaaaaact gcccaagtgc ctgtacacat taagatcaa gaggagggt 44340
 ctgcccagag tcccatctg gccagcaggt ttgtcaagc aaattttgag aaattctctac 44400
 cctccactct tctatattat tatagcactt tataaaaaac attctctctc tgtctctgc 44460
 tctctctctc tctctctctc acacacacac acacacacac gtattataat aacacaaac 44520
 tttctctctc tctctctctc aaacttatct taattttcaa aaggaaaacc tttctctgtg 44580
 ttaattctgac atttttcccc taacacagaa taattttcaa aggttaagaa 44640
 acacatgac tatattctgc caataataat tcttaattta agtaataatc attttcccta 44700
 caggagttta aagaagttac agtaaaagat cctttgtata aatatatg ccagaagatt 44760
 acccaataaa gtgctgagag gtataaaact caaaaacagtt tccggactct ttgtgaaatg 44820

tcttcagagct ctgcgatata tttttctcaa ctaaaattata caagtaagat attttctgtcg 44880
 gctgtgggaaa tgccttaccg catgttactg tggagctcat ggtaaaatag aaagaatata 44940
 aataatcaaaa ataaaattga caaatgataa atgattttaat aaattagaaa ttcaaatgcc 45000
 gggcactttt ctagaacctg gacacaaagc atgaacctaa caataacccc gcccttcattga 45060
 aaaaattgga aaaaattgaa attataacct caacactaaa taaatatctt tcaattcttcc 45120
 agtatattga gatgtttact tcaatttega caatttgctt tccctctctga acacatagatt 45180
 atgtgatggc tctataaaag attttaaaat aactatagaa ggaactattg gaaagacgtg 45240
 tgggatacta aaaatggcta caaagaaggt tatgacaaaa cctctgagtt tgaatggag 45300
 tctcatgcta ttagagtcta agcctgtgac attatgcttc tggttcttgt tcttaaatgc 45360
 ttttctcatt aatagtattg aacttacttc ctggaatgcc attcattaaa aaaaatttta 45420
 atatttgcta aatgtcaata tttatgccag cactttttaa gtacagaaac atggagtctc 45480
 tttacctcat gcaaatatgc tgtgagaagc acttaagagc ctattggcta ctttctggta 45540
 caacactgaa gactcaccat ccaaaaacaa cagacttagt aaattcttgt gatttgcagt 45600
 agttctgttc tataaggtta ccacaaacac tgaatcatc gctcctgggg gaatacaagg 45660
 ttatgtttcc gtgagccctc ggtcacacaa tgttcattaa ctgatcaata cataaccttg 45720
 ttctatgtgt gtttctgttt aaaaagagca ctctagtgct acatttggag tctgttttaa 45780
 acagcaaaat cactaataaa aagcacaaaa atgtaaaagc atggcactac atacactgtg 45840
 acaagaagcc tggtttatag tatgacagct gagacaaaga ggtagacctt cgccttgatc 45900
 aaacctctgt gggaattgag catcagggtga atcaattttt caccactctt aatgaccgta 45960
 aaagtgtccc aaactactgc tttgggggta caataaaatt ttagtaagga ttgtgaactg 46020
 ccaattatgaa atctacaaat aatgagtacc aatgcataat gagtcaaaat ttcatgtgcg 46080
 gtatctgact tgattgccac tgaagaagac agtttggaaa accctcaata aataccgttt 46140
 agttactatg cagacaaaga gttctacact agagtgtctt aattaagatg tctgagggtt 46200
 tctataaattg atgtttttta aaatgttatt tctcaactga tataattctaa aggggatata 46260
 acgaaatcca tttttctctg caggatatcc catgagtttc cgattgatgg cccaaaaactg 46320
 gtcaaatctg tctgtaata 46340

<210> 67

<211> 773

<212> ADN

<213> Homo sapiens

<400> 67

actgagagac aggactagct ggatttcccta ggctgactaa gaatccctaa gcctagctgg 60
 gaaggtgacc acatccacct ttaaacacgg ggcttgoaac ttagtccaca cctgaccaag 120
 gaaggtgacc acacccctct ttaaacacag agcttgaac tcagctcaca cccgaccaat 180
 caggtagtaa agagagctca ctaaaatacc aattaggcta aaaacaggag gtaaagaaat 240
 aatcaaatca tctatcgccct gagagcacag ggggaggagc aatgatcggt atataaacc 300
 aggcatttga gccagatcag tgaacctctt ttgggtcccc tcacactgta tgggagctct 360
 gttttcacct tattaatctt tgcaactgca cactctctctg tccatgtttt gttccggctc 420
 aagctgagct tttgtcgccc gtccacacct gctgaatgcc gccattgacg acctgccctt 480
 gacttccacc cctcgggatt cggcagagtg tccgctgcac tctgtatcca gcgaggcacc 540
 catttccact cccgatcagg ctaaaaggctt gccattgttc ctgcacagct aagtgcctgg 600
 gttcatccta atcagggtga acactggctg ctgggttcca cggttctctt ccatgactca 660
 cagcttctaa tagagctata caactcacca catggcccaa ggttccattc gtttgaatcc 720
 atgaggccaa gaaccccagg tcagagaata aaaggccccc cccatcttgg gag 773

<210> 68

<211> 10

<212> PRT

<213> Homo sapiens

<400> 68

Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val
 1 5 10

<210> 69
<211> 10
<212> PRT
<213> Homo sapiens

<400> 69
Leu Leu Phe Gly Pro Cys Ile Phe Asn Leu
1 5 10

<210> 70
<211> 10
<212> PRT
<213> Homo sapiens

<400> 70
Cys Leu Pro Leu Asn Phe Arg Pro Tyr Val
1 5 10

<210> 71
<211> 10
<212> PRT
<213> Homo sapiens

<400> 71
Gly Leu Leu Ser Gln Trp Met Pro Trp Ile
1 5 10

<210> 72
<211> 9
<212> PRT
<213> Homo sapiens

<400> 72
Cys Leu Pro Ser Gly Ile Phe Phe Val
1 5

<210> 73
<211> 9
<212> PRT
<213> Homo sapiens

<400> 73
Trp Met Pro Trp Ile Leu Pro Phe Leu
1 5

74

<210> 74
<211> 10
<212> PRT
<213> Homo sapiens

<400> 74
Ile Arg Trp Val Thr Pro Pro Thr Gln Ile
1 5 10

<210> 75
<211> 10
<212> PRT
<213> Homo sapiens

<400> 75
Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu
1 5 10

<210> 76
<211> 10
<212> PRT
<213> Homo sapiens

<400> 76
Leu Arg Thr His Thr Arg Leu Val Ser Leu
1 5 10

<210> 77
<211> 10
<212> PRT
<213> Homo sapiens

<400> 77
Lys Arg Val Pro Ile Leu Pro Phe Val Ile
1 5 10

<210> 78
<211> 10
<212> PRT
<213> Homo sapiens

<400> 78
Cys Arg Cys Met Thr Ser Ser Ser Pro Tyr
1 5 10

75

<210> 79
<211> 10
<212> PRT
<213> Homo sapiens

<400> 79
Thr Arg Val His Gly Thr Ser Ser Pro Tyr
1 5 10

<210> 80
<211> 10
<212> PRT
<213> Homo sapiens

<400> 80
Ala Arg Glu Lys His Val Lys Glu Val Ile
1 5 10

<210> 81
<211> 10
<212> PRT
<213> Homo sapiens

<400> 81
Ser Arg Ile Glu Ala Val Lys Leu Gln Met
1 5 10

<210> 82
<211> 10
<212> PRT
<213> Homo sapiens

<400> 82
Ser Gln Trp Met Pro Trp Ile Leu Pro Phe
1 5 10

<210> 83
<211> 9
<212> PRT
<213> Homo sapiens

<400> 83
Cys Tyr Tyr Val Asn Gln Ser Gly Ile
1 5

<210> 84
<211> 9
<212> PRT
<213> Homo sapiens

<400> 84
Phe Tyr Tyr Lys Leu Ser Gln Glu Leu
1 5

<210> 85
<211> 9
<212> PRT
<213> Homo sapiens

<400> 85
Thr Tyr Thr Thr Asn Ser Gln Cys Ile
1 5

<210> 86
<211> 9
<212> PRT
<213> Homo sapiens

<400> 86
Ser Phe Leu Val Pro Pro Met Thr Ile
1 5

<210> 87
<211> 9
<212> PRT
<213> Homo sapiens

<400> 87
Tyr Tyr Val Asn Gln Ser Gly Ile Val
1 5

<210> 88
<211> 9
<212> PRT
<213> Homo sapiens

<400> 88
Leu Phe Asn Thr Thr Leu Thr Gly Leu
1 5

```
<210> 89
<211> 9
<212> PRT
<213> Homo sapiens
```

<400> 89
Leu Phe Gly Pro Cys Ile Phe Asn Leu
1 5

```
<210> 90
<211> 9
<212> PRT
<213> Homo sapiens
```

<400> 90
Arg Trp Val Thr Pro Pro Thr Gln Ile
1 5

```
<210> 91
<211> 10
<212> PRT
<213> Homo sapiens
```

<400> 91
Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile
1 5 10

```
<210> 92
<211> 10
<212> PRT
<213> Homo sapiens
```

```
<400> 92
Leu Pro Tyr His Ile Phe Leu Phe Thr Val
  1             5             10
```

```
<210> 93
<211> 10
<212> PRT
<213> Homo sapiens
```

<400> 93
Gly Ala Leu Gly Thr Gly Ile Gly Gly Ile
1 5 10

78

<210> 94
<211> 10
<212> PRT
<213> Homo sapiens

<400> 94
Leu Pro Phe Val Ile Gly Ala Gly Val Leu
1 5 10

<210> 95
<211> 9
<212> PRT
<213> Homo sapiens

<400> 95
Arg Arg Pro Leu Asp Arg Pro Ala Ser
1 5

<210> 96
<211> 9
<212> PRT
<213> Homo sapiens

<400> 96
Phe Arg Pro Tyr Val Ser Ile Pro Val
1 5

<210> 97
<211> 9
<212> PRT
<213> Homo sapiens

<400> 97
Arg Arg Ala Leu Asp Leu Leu Thr Ala
1 5

<210> 98
<211> 9
<212> PRT
<213> Homo sapiens

<400> 98
Trp Arg Met Gln Arg Pro Gly Asn Ile
1 5

09719554-014301

79

<210> 99
<211> 10
<212> PRT
<213> Homo sapiens

<400> 99
Asp Arg Ile Gln Arg Arg Ala Glu Glu Leu
1 5 10

<210> 100
<211> 10
<212> PRT
<213> Homo sapiens

<400> 100
Leu Arg Thr His Thr Arg Leu Val Ser Leu
1 5 10

<210> 101
<211> 10
<212> PRT
<213> Homo sapiens

<400> 101
Glu Arg Val Ala Asp Ser Leu Val Thr Leu
1 5 10

<210> 102
<211> 10
<212> PRT
<213> Homo sapiens

<400> 102
Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu
1 5 10

<210> 103
<211> 10
<212> PRT
<213> Homo sapiens

<400> 103
Gln Phe Tyr Tyr Lys Leu Ser Gln Glu Leu
1 5 10

09713534-0011001

80

<210> 104
<211> 10
<212> PRT
<213> Homo sapiens

<400> 104
Gln Trp Met Pro Trp Ile Leu Pro Phe Leu
1 5 10

<210> 105
<211> 10
<212> PRT
<213> Homo sapiens

<400> 105
Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val
1 5 10

<210> 106
<211> 10
<212> PRT
<213> Homo sapiens

<400> 106
Asn Phe Val Ser Ser Arg Ile Glu Ala Val
1 5 10

<210> 107
<211> 9
<212> PRT
<213> Homo sapiens

<400> 107
Gly Pro Leu Val Ser Asn Leu Glu Ile
1 5

<210> 108
<211> 9
<212> PRT
<213> Homo sapiens

<400> 108
Leu Pro Leu Asn Phe Arg Pro Tyr Val
1 5

81

<210> 109
<211> 10
<212> PRT
<213> Homo sapiens

<400> 109
Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile
1 5 10

<210> 110
<211> 10
<212> PRT
<213> Homo sapiens

<400> 110
Glu Pro Lys Met Gln Ser Lys Thr Lys Ile
1 5 10

<210> 111
<211> 10
<212> PRT
<213> Homo sapiens

<400> 111
Leu Pro Tyr His Ile Phe Leu Phe Thr Val
1 5 10

<210> 112
<211> 9
<212> PRT
<213> Homo sapiens

<400> 112
Arg Glu Lys His Val Lys Glu Val Ile
1 5

<210> 113
<211> 10
<212> PRT
<213> Homo sapiens

<400> 113
Lys Pro Arg Asn Lys Arg Val Pro Ile Leu
1 5 10

82

<210> 114
<211> 9
<212> PRT
<213> Homo sapiens

<400> 114
Val Val Leu Gln Asn Arg Arg Ala Leu
1 5

<210> 115
<211> 10
<212> PRT
<213> Homo sapiens

<400> 115
Ala Val Val Leu Gln Asn Arg Arg Ala Leu
1 5 10

<210> 116
<211> 9
<212> PRT
<213> Homo sapiens

<400> 116
Leu Pro Phe Val Ile Gly Ala Gly Val
1 5

<210> 117
<211> 9
<212> PRT
<213> Homo sapiens

<400> 117
Asp Leu Tyr Ser Tyr Val Ile Ser Lys
1 5

<210> 118
<211> 10
<212> PRT
<213> Homo sapiens

<400> 118
Thr Glu Gln Asp Leu Tyr Ser Tyr Val Ile
1 5 10

09719554-1011001

<210> 119
 <211> 2615
 <212> ADN
 <213> Homo sapiens

<400> 119
 gaattccggg aagccagacg gtttaacacag acaaaagtgt gccgtgacac tcggccctcc 60
 agtgttgcgg agagacgaag cgacgcaccg cgcaactgtc cgcccgagc tgggacgcgc 120
 ccggcgccgg ccggacgaag cgaggaggga ccgcgcgagg tgcctccaa tgtaactcca 180
 gcactgtgag gtttcaggga ttggcagagg ggaccaaggg gacatgaaaa tggacatgga 240
 ggatcgcgag atgactctgt ggacagaggc tgagtttgaa gagaagtgtg catacattgt 300
 gaacgaccac ccctgggatt ctggtgtcta tggcggtact tcggttcagg cggaggcatc 360
 cttaccaagg aatctgcttt tcaagtatgc caccacagc gaagaggtta ttggagtgtg 420
 gagtaaaaga tacataccaa agggcacacg ttttgacccc ctaaatagggt aaatctacac 480
 caatgacaca gttcctaaga acgccaacag gaaatatttt tggaggatct attccaggag 540
 ggagcttcac caactcaattg acggctttaa tgaagagaaa agcaactgga tgcgctatgt 600
 gaatccagca cactctcccc gggagcaaaa cctggctgcg tgcagaaacg ggatgaacat 660
 ctactttcac accattaagc ccatccctgc caaccaggaa ctcttgtgtt ggtattgtcg 720
 ggaactttgca gaaaggcttc actaccctta tcccgagag ctgacaatga tgaatctcac 780
 aaaaacacag agcaggttca agcaaccagg cactgagaaa aatgaactct gcccaaaaga 840
 tgtcccaaaag agagagtaca cggtgaaaaga aatcctaaaa ttgactccaa accctccaa 900
 aggaagaagc ctctacggtt ctaaacatttc acccctcaca tcagaaaagg acctcgatga 960
 ctttagaaga cgtgggagcc ccgaaaatgcc ctctcactcc cggttcggtt accccatccg 1020
 ggccctctcg ccagaagact ttttgaaagc ttccctggcc tacgggactg agagaccacg 1080
 gtactcaact cgtctcccca ttccatctct caccactcca agccctctga caagaagcag 1140
 ccccgaccaa agcctcaaga gctccagccc tcacagcagc cctgggaatg cgtgtgtccc 1200
 tgtggggccc ggctctcaag agcaccggga ctctcactgt tacttgaacg cgtcctacgg 1260
 cacggaaaggt ttgggtctct accctggcta cgcacccctg ccccaactcc cggcagcttt 1320
 catccctcgt tacaaagctc actaccccaa gtctcctctg ccccccctacg gcatgaattg 1380
 taatggcctg agcgtctgtg gcagcatgaa tggcatcaac aactttggcc tcttcccgag 1440
 gctgtgcctt gcttacagca atctcctcgg tgggggcagc ctgcccacc ccattgtcaa 1500
 ccccacttct ctcccagct cgtgcctctc agatggagcc cggaggttgc tccagccgga 1560
 gcattccagg gaggtgcttg tcccggcgc ccacagtgc ttctccttta cgggggcgcg 1620
 cgccagcatg aaggacaagg cctgtagccc cacaagcggg ttccccacgg cgggaacagc 1680
 cgccacgga gaacatgttg tgaagcccaa agctacctca gcagcgatgg cagccccag 1740
 cagcgagaa gccatgaatc tcattaaaaa caaaagaaac atgaccggct acaagacctt 1800
 tccctaccgc ctgaagaagc agaaccggaa gatcaagtac gaatgcaacg tttgcgccaa 1860
 gactttcgcc cagctctcca atctgaaggt ccacctgaga gtcacagtg gagaacggcc 1920
 tttcaaatgt cagacttgca acaagggtt tactcagctc gccacactgc agaaacacta 1980
 cctggatcac accgggagaa agccacatga atgccaggtc atgccagatg gatttagcag 2040
 caccagcaat ctaagagccc accctgcgact ccatctctga gagaacacct accaatgcaa 2100
 ggtgtgcctt gccaggttca cccagtttgt gcacctgaaa ctgcacacgc gctcgacacg 2160
 cggggagcgg ccccaacagt gctccagtg ccacaagaac tacatccatc tctgtagcct 2220
 caagtttca ctgaaaggga actgcgtgc tgcctcgagg ggcctcgagg ccttggaaga 2280
 tctgaccgga atcaatgaag aaatcgagaa gtttgacatc agtgacaagt ctgacggcgt 2340
 cagagacgtg gaggatgaca tcagtgtgat ctctgtagt gagaagaaa ttctggccgt 2400
 ggtcagaaaa gagaaaagaa aaactggcct gaaagtgtct ttgcaagaaa acatggggaa 2460
 tggactcttc tctcagggg gcagccttta tgagtcacga gatctacccc taatgaattt 2520
 gccctccagc aacccactac ctctggtacc tghtaaaggt aaacaagaaa cagttgaacc 2580
 aatgatctct taagattttc agaaaacact tattt 2615

<210> 120
 <211> 29
 <212> PRT
 <213> Homo sapiens

84

<400> 120

Leu Gln Asn Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly
 1 5 10 15

Thr Cys Leu Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val
 20 25

<210> 121

<211> 21

<212> ADN

<213> Homo sapiens

<400> 121

cttcaaacaa caaccaggag g

21

<210> 122

<211> 20

<212> ADN

<213> Homo sapiens

<400> 122

ttggggaggt tggccgacga

20

SEQUENCE LISTING <110> ALLIEL, Patrick PERIN, Jean-Pierre

RIEGER, Francois <120> NUCLEIC ACID SEQUENCE AND DEDUCED PROTEIN SEQUENCE FAMILY
 WITH HUMAN ENDOGENOUS RETROVIRAL MOTIFS <130> 200936USOPCT <150> PCT/FR99/01513 <151>
 1999-06-25 <160> 122 <170> PatentIn version 3.1 <210> 1 <211> 2599 <212> DNA
 <213> Homo sapiens <400> 1

```

atccccctgcc ttaatcgcca agctccttca ggagaacaaa gaacaggcca ttaccctgga      60
gaagactggc aactgatttt acccacaagc ccaaacctca gggatttcag tatctactag      120
tctgggtaga tactttcacg ggttgggcag aggccttccc ctgtaggaca gaaaaggccc      180
aagaggtaat aaaggcacta gttcatgaaa taattcccag attcggactt ccccaggcct      240
tacagagtga caatagccct gcitttcagg ccacagtaac ccagggagta tccaggcggt      300
taggtatacg atatcactta cactgcgcct gaaggccaca gtcctcaggg aaggtcgaga      360
aaatgaatga aacactcaaa ggacatctaa aaaagcaaac ccaggaaaac cactcacat      420
ggcctgctct gttgcctata gccttaaaaa gaatctgcaa ctttcccaa aaagcaggac      480
ttagcccata cgaaatgctg tatggaagc ccttcataac caatgacctt gtgcttgacc      540
caagacagcc aacttagttg cagacatcac ctcttagcc aaatatcaac aagttcttaa      600
cacattacaa ggaacctatc cctgagaaga gggaaaagaa ctattccacc cttgtgacat      660
gttattagtc aagtccttcc cctctaattc cccatcccta gatactcct gggaaggacc      720
ctaccagtc attttatcta ccccaactgc ggttaaaagt gctggagtgg agtcctggat      780
catcacact tgagtcaaat cctggatact gccaaaaggaa cctgaaaatc caggagacaa      840
cgctagctat tctgtggaac ctctagagga ttgcgccctg ctcttcaaac aacaaccagg      900
aggaaagtaa ctaaaatcat aaatccocat ggccctccct taccatattt ttctctttac      960
tttcttttta cctcttttca ctctcactgc accccctcca tgccgctgta tgaccagtag      1020
ctccccttac caagagtttc tatggagaat gcagcgctcc ggaaatattg atgcccctac      1080
gtataggagt ctttctaagg gaacccccac ctctactgcc cacaccata tgcccgcgaa      1140
ctgtatcac tctgccactc ttgcatgca tgcaataact cattattgga caggaanaat      1200
gattaatcct agttgtcctg gaggacttgg agtcactgtc tgttggaact acttcaacca      1260
aactggtatg tctgatgggg gtggagttca agatcaggca agagaaaaac atgtaaaaga      1320
agtaatctcc caactcacc gggtacatgg cactcttagc cctacaaaag gactagatct      1380
ctaaaaacta catgaaaccc tccgtaccca tactgcctg gtaagcctat ttaataccac      1440
cctcactggg ctccatgagg tctcgcccca aaacctact aactgttgga tatgcctccc      1500
cctgaacttc aggccatgat tttaaatccc tgtacctgaa caatggaaca acttcagcac      1560
agaaataaac accacttccg ttttagtagg acctctgtt tccaatctgg aaataaccca      1620
tacctcaaac ctacactgtg taaaatttag caatactaca tacacaacca actccaatg      1680
catcaggtgg gtaactcctc ccacacaaat agtctgccta cctcagggaa tattttttgt      1740

```

ctgtgtgatacc	tcagccctatc	gttgtttgaa	tggctcttca	gaatctatgt	gcttctcttc	1800
attcttagtg	ccccctatga	ccatctacac	tgaacaagat	ttatacagtt	atgtcatatc	1860
taagcccccgc	aacaaaagag	taccattctc	tccttttgtt	ataggagcag	gagtgtctagg	1920
tgcactaggt	actggcattg	gcggtatcac	aaacctctact	cagttctact	acaaactatc	1980
tcaagaacta	aatggggaca	tggaacgggt	cgccgactcc	ctggtcacct	tgcaagatca	2040
acttaactcc	ctagcagcag	tagtctctca	aaatcgaaga	gctttagact	tgctaaccgc	2100
tgaagagagg	ggaacctgtt	tatttttagg	ggaagaatgc	tgttattatg	ttaatcaatc	2160
cggaatcgtc	actgagaaag	ttaaagaaat	tcgagatcga	atacaacgta	gagcagagga	2220
gcttcgaaac	actggacctc	ggggcctcct	cagccaatgg	atgccctgga	ttctcccctt	2280
cttaggacct	ctagcagcta	taatattgct	actcctcttt	ggaccttgta	tctttaacct	2340
ccttggttaac	tttgtctctt	ccagaatcga	agctgttaaa	ctacaaatgg	agcccaagat	2400
gcagttccaag	actaagatct	accgcagacc	cctggaccgg	cctgctagcc	cacgatctga	2460
tggttaatgac	atcaaaaggca	ccctcctcga	ggaaatctca	gctgcacaac	ctctactacg	2520
gcaccaattca	gcaggaagca	gttagagcgg	tctcgcccaa	cctccccaac	agcacttagg	2580
gttttctggtt	gagatggggg					2599

agtcagctgc agacattaga aaaaaacttc aaaagctctgc cgtagggccc	gagcaaaact	960
tagaaaacctt attgaacttg gcaacctcgg ttttttataa tagagatcag	gaggagcagg	1020
cggaaacagga caaacgggat taaaaaaaaag gccaccgctt tagtcatgac	cctcaggcaa	1080
gtggactttg gaggctctgg aaaagggaag agctgggcaa attgaatgcc	taataaggct	1140
tgcttcacgt gcggtctaca aggacacttt aaaaaagatt gtccaagtag	aagtaagccg	1200
ccccctcgtc catgccccctt atttcaaggg aatcactgga aggccactg	ccccagggga	1260
caaaggctct ctgagtcaga agccactaac cagatgatcc agcagcagga	ctgagggtgc	1320
ctggggg		1326

<210> 3 <211> 10499 <212> DNA <213> Homo sapiens <400> 3		
ccctggggcg ggcttccctt ctgggatgag ggcaaaacgc ctggagatac	agcaattatc	60
ttgcaactga gagacaggac tagctggatt tctaggccg actaagaatc	cctaagccta	120
gctgggaagg tgaccacgtc cacctttaa caggggctt gcaacttagc	tcacacctga	180
gcaatcagag agctcactaa aatgctaatt aggcaaagac aggaggtaaa	gaaatagcca	240
atcatctatt gcctgagagc acagcaggag ggacaacaat cgggatataa	accaggcat	300
cgagctggc aacagcagcc cccctttggg tcccttccct ttgtatggga	gctgttttca	360
tgctatttca ctctattaaa tcttgcaact gcaactctct ggtccatgtt	tcttacggct	420
cgagctgagc ttttgctcac cgtccaccac tgcgttttgc caccaccgca	gacctgccgc	480
ggactcccat cctctggat cctgcagggt gtccgctgtg ctctgatcc	agcgaggcgc	540
gcattgccgc tcccaattgg gctaaggct tgccattgtt cctgcacggc	taagtgcctg	600
ggttttgtct aattgagctg aacactagtc actgggttcc atggttctct	tctgtgaccc	660
acggcttcta atagaactat aacacttacc acatggccca agattccatt	ccttgggaatc	720
cgtgaggcca agaactccag gtcagagaat acgaggcttg ccaccatctt	ggaagcggcc	780
tgctaccatc ttggaagtg ttaccacca tcttgggagc tctgtgagca	aggaccccc	840
ggtaacattt tggcaaccac gaacggacat ccaaagtggt gagtaatatt	ggaccacttt	900
cacttgctat tctgtcctat ccttccttag aattggagga aaataccggg	cacttgtcgg	960
ccagttaaaa acgattagtg tggccacggc acttaagact cagggtgtgag	gctatctggg	1020
gaagggcttt ctaacaaccc ccaacccttc tgggttggg acttgggttg	cctcaagcca	1080
gcttccactt tcagttttct tggggaagcc gagggccgac tagaggcaga	aagctgtcgt	1140
cctgaactcc cggcagtagc cggttgagat catggtgtag ccagaagtct	caacagtcgc	1200
ccatgcatgc acccctatct ttcttctga cccatacctc ctgggtccca	accacaactt	1260
tcttcaaagt gtagcccaaa aattctcctt acctctgaat atacttctc	tgatccctgc	1320

ctcctaggtgta	ctattgggttc	agacttccat	tccctctagc	aagttgtatc	tccaaaggga	1380
tctaaggaag	ctctgcgctg	cgctcctagg	cacctaggct	ataaccaggg	gagtccttacc	1440
cctgggtgtcc	ctcccaattt	aggcatacag	ctcttgacat	gggcagttat	gtaggaccca	1500
ctccccacca	cocctgccag	ggccccaagt	ttgtaaatgg	ctgagggaaa	agagagacag	1560
aggagagaga	gagaaaatgga	ggagaaagag	agagagacag	agaggagaga	gagacagtga	1620
gagagacaga	agagagagag	agacaaagag	gagagagaga	gagtcaaaag	gagaaagaaa	1680
gagaaagaaa	tagtaaaaaa	cagtgtgccc	tattccttta	aaagccaggg	taaatattaaa	1740
acctgtactt	gataattgaa	ggtcttctct	gtgaccctat	agcactccaa	tccactttgt	1800
ggtcagtgtg	aataagagca	taggccgaaa	gcactgaggc	cattgacaac	ccgtagcttc	1860
cctatcaaaa	atccttaaac	cagtaaccgc	cagatggacc	aaatgcattc	agtcggtagc	1920
gcaactgctt	tgctaaaagt	agaaaagtaa	cttttagagg	aaacctcatt	gtgagcacac	1980
ctcacctggt	cagaattatt	ctaataaaaa	aagcaaaaaa	gtagcttact	aactcaaaaa	2040
ctttaaagta	tggggctatt	ctgttagaaa	aaggtaatgt	aactccaacc	actgataatt	2100
ctcttaaccc	agcagatttc	ctaacgggat	ttaaacttta	attaccatac	aaaggtccga	2160
ctcagacctag	gcggaactcc	cttcaggaca	ggacgataga	tggttcctcc	caggtgattg	2220
ctggaaaaaaa	ccacaatggg	tattcagtaa	ttgatacggg	gactcttggt	gaagcagagt	2280
ctgaaaaaatt	gcctaataac	tggtctcttc	aaacgtgtga	gctgtttgca	ctcagccaag	2340
ctcttaagta	cttacagaat	caaaaagacta	tctcaatcct	gattcaaaag	gttagctaca	2400
ctctctctgt	aatgcatttg	cataagaact	tgtttatggg	aatgcatctt	gatggggcag	2460
ctggggttgtt	ataaaaatag	aaccagagcc	agctctagga	ctcacccttg	agcgcaaaag	2520
caatgtttgg	catgctgtga	aaggaccact	agaatccagc	agcccagacc	cctttctttg	2580
tggtcaagaa	aggcgggaaa	aggggtgcag	gactgctaca	tcggtagaca	taactaatcc	2640
gataaacaga	ggtccattgg	tggttacgca	ccctggaaaag	gaactcacc	ctgagcacaa	2700
aggcaatgtt	gggcacgctg	gtaaaggacc	actagaatcc	agcagcctgg	accctcttct	2760
ttgtggtcaa	gagaggcagg	aaaacagggt	caggactgca	acatcagtga	gcataactaa	2820
ttcgataagc	agaggtccat	gggtgggtgat	gcaccttgga	aagaataagc	attaggacca	2880
tagaggacac	tccaggacta	aagctcatcg	gaaaatgact	aggggtgctg	gcattccctat	2940
gttctttttt	cagatgggaa	acgttccccc	caagacaaaa	acgcccctaa	gacgtattct	3000
ggagaattgg	gaccaatttg	acctccagac	actaagaaag	aaacgactta	tattctcttg	3060
cagtgcgcc	tggcactcct	gaggaagta	taaattataa	caccatttta	cagctagacc	3120
ctttttgtag	aaaaggcaaa	tgagtggaag	tgccataagt	acaaactttc	ttttcattaa	3180

gagacaactc acaattatgt aaaaagtgtg atttatgccc tacaggaagc cttcagagtc 3240
 tacctcccta tcccagcatc cccgactcct tcccctaacta ataaggaccc cccttcaacc 3300
 caaatggtcc aaaaggagat agacaaaagg gtaaacagtg aaccaaagag tgccaatatt 3360
 ccccaattat gacctccca agcagtggga ggaagagaat tcggccagc cagagtgcac 3420
 gtgccttttt ctctcccaga cttaaagcaa ataaaaacag acttaggtaa attctcagat 3480
 aacctgatg gctatattga tgttttacia gggttaggac aattcttga tctgacatgg 3540
 agagatataa tgtcactgct aatcagaca ctaaccccaa atgagagaag tgccaccata 3600
 actgcagcct gagagtattg cgtctctggt tatctcagtc aggtcaatga taggatgaca 3660
 acagaggaag gagaatgatt ccccacaggc cagcaggcag ttcacagtc agacctcat 3720
 tgggacacag aatcagaaca tggagattgg tgctgcagac atttgctaac ttgtgtgcta 3780
 gaaggactaa gaaaaactag gaagaagtct atgaattact caatgatgac caccataaca 3840
 gaggggaagg aagaaatcc tactgccttt ctggagagac taaggaggc attgaggaag 3900
 cgtgcctctc tgtcacctga ctctctgtaa ggccaactaa tcttaaagcg taagtttacc 3960
 ctccagtcag ctgcagacat tagaaaaaaa cttcaaaagt ctgccgtagg cccggagcaa 4020
 ttaactagaaa ccctattgaa ctggcaacc tcgggttttt ataatagaga tcaggaggag 4080
 caggcggaac aggacaaacg ggattaaaaa aaaggccacc gctttagtca tgacctcag 4140
 tcaagtgagc tttggaggct ctggaagagg gaaaagctgg gcaaattgaa tgacctaatg 4200
 tggcttgctc cagtgcggtc tacaaggaca ctttaaaaaa gattgtccaa gtagaagtaa 4260
 tccgccccct cgtccatgcc ctttatttca agggaaacac tggaaggccc actgccccag 4320
 tggacaaaag tctctgagt cagaagccac taaccagatg atccagcagc aggactgag 4380
 gtgcctgggg caagcgccat cccatgccat caccctcaca gagccctggg tatgcttgac 4440
 cattgagggc caggaggttg tctcctggac actggtgcgg tcttcttagt cttactcttc 4500
 tgcctccgac aactgtctc cagatctgtc actatctgag ggggtcctaa gacgggcagt 4560
 cactagatac ttctcccagc cactaagtta tgactgggga gctttattct ttccacatgc 4620
 ttttctaatt atgcttgaaa gcccactac cttgttaggg agagacattc tagcaaaagc 4680
 aggggccatt atacacctga acataggaga aggaacaccc gtttgtgtc cctgtcttga 4740
 ggaaggaatt aatcctgaag tctgggcaac agaaggacaa tatggacgag caaagaatgc 4800
 ccgtctgtt caagttaaac taaaggattc caccctcttt ccctaccaaa ggcagtaacc 4860
 cctcagaccc aaggcccaac aaggactcca aaagattgtt aaggacctaa aagcccaagg 4920
 cctagtaaaa ccatgcagta acccctgcag tactccaatt ttaggagtag agaaacccaa 4980
 cagacagtgg aggttagtgc aagatctcag gattatcaat gaggtgttg ttcctctata 5040

ccagcgtgta cctagccctt atactctgct ttcccaata ccagaggaag cagagtgtgt 5100
 tacagtctctg gaccttcagg atgctctctt ctgcatccct gtacatccct actctcaatt 5160
 cttgttttggc tttagaagata cttcaaaccc aacatctcaa ctcacctgga ctattttacc 5220
 ccaagggttc agggatagtc cccatctatt tggccaggca ttagcccaag acttgagcca 5280
 atctctatc ctggacactt gtccttcggt aggtggatga tttacttttg gcgcccatt 5340
 cagaaacctt gtgcccataa gccaccaag cgtctctcaa tttctogct acctgtggct 5400
 acatgtgttc caaaccaag gctcaactct gctcacagca ggttacttag ggctaaaatt 5460
 atccaaaggc accagggccc tcagttagga acacatccag cctatactgg cttatctctc 5520
 tcccaaaccc ctaaagcaac taaggggatt ccttggcgta ataggtttct gccgaaaatg 5580
 gattcccagg tatggcgaaa tagccaggtc attaaatata ctaattaagg aaactcagaa 5640
 agccaatacc catttagtaa gatggacaac tgaagtagaa gtggctttcc aggcctaacc 5700
 ccaagcccca gtgttaagtt tgccaacagg gcaagacttt tcttcatatg tcacagaaaa 5760
 acaggaata gctctaggag tccttacaca gatccagggt atgagcttgc aacctgtggc 5820
 ctacctgact aaggaaattg atgtagtggc aaagggttga cctcattgtt tacgggtagt 5880
 ggtggcagta gcagtcctag tatctgaagc agttaaaata atacagggaa gagatcttac 5940
 tgtgtggaca tctcatgatg tgaatggcat actcactgct aaaggagact tgtggctgtc 6000
 gagacaactgt ttactttaat gtcaggctct attacttgaa gggccagtgc tgcgactgtg 6060
 gacttgtgca actottaacc cagccacatt tcttcagac aatgaagaaa agataaaaca 6120
 taactgtcoa caagtaattt ctcaaaccta tgccactcga ggggaccttt tagaggttcc 6180
 ttgtgactgat ccgacotca acttgtatc tgatggaagt tcctttgtag aaaaaggact 6240
 tcgaaaagtg gggtagtcag tggtcagtga taatggaata cttgaaagta atccctcac 6300
 tccaggaact agtctcagc tagcagaact aatagccctc acttgggcac tagaattagg 6360
 agaagaaaaa agggcaataa tatatacaga ctctaaatat gcttacctag tctccatgc 6420
 ccatgcagca atatggaag aaagggaatt cctaacttct gagagaacac ctatcaaaaca 6480
 tcaggaagcc attaggaat tattattggc tgtacagaaa cctaaagag tggcagctct 6540
 acactgccg ggtcatcaga aaggaaagga aagggaata gaagagaact gccaaagcaga 6600
 tattgaagcc aaaagagctg caaggcagga cctccatta gaaatgttta taaaacaacc 6660
 cctagtatag ggtaatcccc tccgggaaac caagcccag tactcagcag gaaaaacaga 6720
 atggggaacc tcacaggagc agttttctcc cctcgggacg gctagccact gaagaaggga 6780
 aaatactttt gctgcaact atccaatgga aattacttaa aaccttcat caaaccttcc 6840
 acttaggcat cgatagacc catcagatgg ccaaatcatt atttactgga ccaggccttt 6900

c	caaaactat caagcagata gtcagggcct gtgaagtgtg ccagagaaat aatccccctgc	6960
	cttatcgcca agctccttca ggagaacaaa gaacaggcca ttaccctgga gaagactggc	7020
	aactgatttt acccacaagc ccaaacctca gggatttcag tatctactag tctgggtaga	7080
	tactttcacg ggttgggcag aggccttccc ctgtaggaca gaaaaggccc aagaggtaat	7140
	aaaggcacta gttcatgaaa taattcccag attcggactt ccccgaggct tacagagtga	7200
	caatagccct gctttccagg ccacagtaac ccagggagta tcccaggcgt taggtatacg	7260
	atatacctta cactgcgcct gaaggccaca gtccctcaggg aaggctcgaga aaatgaatga	7320
	aacactcaaa ggacatctaa aaaagcaaac ccaggaaacc cacctcacat ggccctgctct	7380
	gttgccata gctctaaaaa gaatctgcaa ctttccccaa aaagcaggac ttaggccata	7440
	cgaaatgctg tatggaaagg ccttcataac caatgacctt gtgcttgacc caagacagcc	7500
	aacttagttg cagacatcac ctcccttagcc aaatatcaac aagttcttaa aacattacaa	7560
	ggaacctatc cctgagaaga gggaaaagaa ctattccacc cttgtgacat ggtattagtc	7620
	aagtcctctc cctctaattc cccatcccta gatacatcct gggaaggacc ctaccagtc	7680
	ctttttatcta ccccaactgc ggttaaagtg gctggagtgg agtcttggt acatcacact	7740
	ggagtgcaat cctggatact gccaaaggaa cctgaaaatc caggagacaa cgctagctat	7800
	ctctgtgaac ctctagagga ttctgcgcctg ctcttcaaac aacaaccagg aggaaagtaa	7860
	ctaaatcat aaatccccat ggccctccct tatcatattt ttctctttac tgttctttta	7920
	ccctctttca ctctcactgc accccctcca tgcgcctgta tgaccagtag ctcccttac	7980
	gaagagtctc tatggagaat gcagcgtccc ggaaatatg atgccccatc gtataggagt	8040
	ctttctaagg gaacccccac ctctcactgcc cacaccata tgccccgcaa ctgctatcac	8100
	tctgccactc tttgcataca tgcaataact cattattgga caggaaaaat gattaatcct	8160
	agttgtcctg gaggacttgg agtcactgtc tgttggaact acttcaccca aactggtagt	8220
	tctgatgggg gtggagtcca agatcaggca agagaaaaac atgtaaaaga agtaatctcc	8280
	caactcaccg gggtagatgg cacctctagc cctacaaaag gactagatct ctcaaaacta	8340
	catgaaaccc tccgtaccca tactcgcctg gtaagccctat ttaataccac cctcactggg	8400
	ctccatgagg tctcggccca aaaccctact aactgttgga tatgcctccc cctgaacttc	8460
	aggccatagt tttcaatccc tgtacctgaa caatggaaca acttcagcac agaaataaac	8520
	accacttcgg ttttagtagg acctcttgtt tccaatctgg aaataaccca tacctcaaac	8580
	ctcacctgtg taaaatttag caatactaca tacacaacca actcccaatg catcaggtgg	8640
	gtaactctc cccacacaaat agtctgccta cctcaggaa tattttttgt ctgtgggtacc	8700
	tcagccctatc gttgtttgaa tggctcttca gaatctatgt gcttcctctc attcttagtg	8760

cccctatga ccatctacac tgaacaagat ttatacagtt atgtcatatc taagccccgc 8820
 aacaaaagag tacccattct tccctttgtt ataggagcag gagtgttagg tgcactagggt 8880
 actggcattg gcggtatcac aacctctact cagttctact acaaatctatc tcaagaacta 8940
 aatggggaca tggaaacgggt cgcgactcc ctggtcacct tgcaagatca acttaactcc 9000
 ctacgagcag tagtccctca aaatcgaaga gcttttagact tgctaaccgc tgaagagagg 9060
 ggaacctgtt tattttttagg ggaagaatgc tgttattatg ttaatcaatc cggaatcgtc 9120
 actgagaag ttaaagaaat togagatoga atacaacgta gagcagagga gcttcgaaac 9180
 actggacctt ggggcctcct cagccaatgg atgcacctgga ttctccctct cttaggacct 9240
 ctacgagcta taatattgct actcctcttt ggacctgta tctttaacct ccttggttaac 9300
 tttgtctctt ccagaatcga agctgtaaaa ctacaatagg agcccaagat gcagtccaag 9360
 actaagatct accgcagacc cctggaccgg cctgctagcc cactgatctga tgttaatgac 9420
 ctcaaagga cccctcctga ggaaatctca gctgcacaac ctctactacg cccaattca 9480
 gcaggaaaga gttagagcgg tctcgcccaa cctcccacac agcacttagg ttttctgtt 9540
 gagatggggg actgagagac aggactagct ggatttccta ggctgactaa gaatccctaa 9600
 gctctagctg gaaggtgacc acatccacct ttaaacacgg ggcttgcaac ttagctca 9660
 cctgaccaat cagagagctc actaaaatgc taattaggca aagacaggag gtaaaagaaat 9720
 agccaatcat ctattgctct agagcacagc aggggggaca atgatcggga tataaaccca 9780
 agttctctag ccggcaacgg caacccctt tgggtccctt cctttgttat gggagctctg 9840
 ttttcatgct atttactct attaaatctt gcaactgcac tctctgggtc catgtttctt 9900
 acgggttgag ctgagcttcc gctcgccatc caccactgct gtttgccgcc accgcagacc 9960
 cgccgctgac tcccatccct ctggatcatg cagggtgtcc gctgtgtcc tgatccagcg 10020
 aggcacccat tgcgctccc aatcgggcta aaggttgtcc attgttctg catggctaag 10080
 tgctggggtt catcctaatt gagctgaaca ctagtcaact gggtccatgg ttctctctg 10140
 tgaccacagc cttctaatag agctataaca ctacccgat ggccaagggt tccattcctt 10200
 gaatccataa ggccaagaac ccaggtcag agaacacgag gcttgccacc atcttgggag 10260
 ctctgtgagc aaggaccccc aagtaacaca accatgaggg tgcaaatgca tgggccacta 10320
 atggttagagc aagaaaacag aaggccctg gttcctcgaa ggcacagtg agctgaaatg 10380
 cctgcctctg atgtctatt cctaggtgtt tttctgctg aagcagatta aacctttgtt 10440
 tcaattctcc aagtagggct tctattacag cccaatacaa tccccacccc agatgacat 10499

<210> 4 <211> 2784 <212> DNA <213> Homo sapiens <400> 4
 ctccttcagg agaacaaga acaggccact acccaagaga agactggcaa ctagatttta 60

cccatattgcc caaatctcag ggatttcagt atctactagt ttgggtagat actttcactg 120
 gttgggcaga ggccttcccc ttaggacag aaaaggccca agaggtaata aacgttcagt 180
 aaataattcc cagattcggga ctcccccaag gcttacagag tgacaatggc cctgctttca 240
 aggtacagt aaccaagga gtatccagg tgtaggtat acaatatcac tcacactgcg 300
 cctggaggcc acagtctca ggaagggtg agaaatgaa caaacacto aaatgacatc 360
 taaaaagct aatccaggaa acccacctcg catggcctgc tctgttgcct atagccttac 420
 taagaatccg aaactctccc caaaaagcag gacttagtcc atacaaatg ctgtatggac 480
 ggcccttctt aaccaatgaa cttgggcttg accgagagac agccaactta gttgcagaca 540
 tcatctctt agccaaatat caacagggtc ttaaaacatt acagggagcc tgtccccaag 600
 aagagggaaa ggaactattc caccctggtg acatggtatt agtcaagtcc cttccctcta 660
 attcccatc ctagatata tcttgggaag gaaactcccc agccatttta tctaccctaa 720
 aggcagttaa agtgcttga gggagtcct ggatacatca cactcaagtc aaaccttgga 780
 tactgcaaaa ggaactcaaa aatccatgag acaatgctag ctattctctgt gaacctctag 840
 aggatctcgc cctgctcttc aatgacaac cagggggaaa gtaactaaaa tctgaaatcc 900
 actggccctc cttatcata tttttctctt taactgtctc ttacccctct tcaactctac 960
 tggcaccctg ccatgccact gcaccctgtc catgcccctg ccatgccagt agctcccctt 1020
 agcaagagtt tctatggaga atgcagctc ccggaatat tgatgcccc ttgtatagga 1080
 gtttatctaa gggaaacccc accctcactg cccacacca tatgcccac aactgtata 1140
 cctctgccac tctttgcatg catgcaaata ctattattg gacaggaaaa acgattaatc 1200
 ccagttgtcc tggaggactt ggaggactca cttcactcat accagtatgt ctgatggggg 1260
 tggagttaa gatcaggcaa cagaaaaaca cataaaggaa gtaatctccc aactgacctg 1320
 ggtacatagc acccctggcc cctacaaagg actagatctc tcaaaactac atgaaacctt 1380
 ccatacccat actggcctgg taagcctatt taataccacc ctgactgggc tccatgaggt 1440
 ctggcccaa aacctacta actgttgat gtgcctcccc ctgacttcta ggccatacat 1500
 ttcaatccct atacctgaac aatggaacaa cttcagcaca gaaataaaca ccacttctgt 1560
 tttagtaggt cctctttcca atctgaaat aaccataacc tcaaacctca cctgtgtaaa 1620
 atttagcaat actatagaca cagccaactc ccaatgcac aggtgggtaa ctccctccac 1680
 acgaatagtc tgccatccct caggaaatatt ttttgtctgt ggtacctcag cctatcattg 1740
 tttgaatggc tcttcagaat ctgtgtgctt cctctcattc ttagtggccc ctatgcccac 1800
 ctacactgaa caagatttat acaatcatgt catacctaag ccccgcaaca aaagagtacc 1860
 cattcttctt tttgtattg gacgaggagt gctaggcgga gtagtactg gcattggcgg 1920

catcacaacc tctactcagt tctactacaa actgtctcaa gaactaaatg gtgacatgga 1980
 atgggtgcgt gataccctgg tcaccttgca agatcaactt aactccctag cagcagtagt 2040
 ccttcaaaat cgaagagctt tagacttgct aaccgcggaa agcgggggaa cctttttatt 2100
 ttttagaggaa aaatgctggt gttatgttaa tcaatccgga atcatcaccg agaaagttaa 2160
 agaaattcaa ggtcgaatat aacgtagagc aaaggagctg caaaacactg gaccctgggg 2220
 cctctcagc caatggatgc cctggattct ccccttctta ggacctctag cagctataat 2280
 attgttactc ctctttggac cctgtatctt taacctcctt gttaaagtgt tcttttccag 2340
 aatcgagaca gtaaaactac aaatcgttct tcaaatggag cccagatgac agtccatgag 2400
 taaaatctac cagcgacccc tggaccggcc tgctagccca tgctctgatg ttaattgacat 2460
 caaaggcacc cctcccgagg aaatctcaac tgcacaaact ctactacgcc ccaattcagc 2520
 aggaagcagt tagagtgttt gttggccaac ctcccccaaca gcagttgggt tttctgtgtg 2580
 agggggggga ctgagagaca ggaataacta gatttcctag accaactaag aatccctaag 2640
 actagctggg aaggtagcgc ctccacactt taaacaccgg gcttgcaact tagctcacgc 2700
 caaccaatc agatactaaa gagagctcac taaaatgcta attaggcaaa aacaggagat 2760
 aaagaaatag ccaatctatc gttg 2784
 <210> 5 <211> 1799 <212> DNA <213> Homo sapiens <400> 5
 ggattctta gtcggcctag gaaatccagc taatcctgtc tctcagtc ccactcaac 60
 agggaaaacc aagtgtgtt ggggaggttg gctgacgacc agtctaactg ctctctgcgg 120
 attggggca tagtaggggt tgtgcagttg agatttcctc gggaggggtg cgttcgatat 180
 cattacaatt ggagcatggg ctagtaggcc ggtccagggg tccacggtag atcttagtca 240
 tggacttcat ctggggttcc atttgaagaa cgattttagt ctttacaact ttgattctgg 300
 aagagacaaa cttaacaagg aggttaaaga tacagggtcc aaaggaggat atcaatatta 360
 gagctgctag agatcctaag aagggggagaa tccagggcac ccattggctg aggagggccc 420
 agggctctgt gtttttgaag ctctctgttt ctacgttgta ttcaatctcg aatttcttca 480
 actttctctg tgacaattca ggattgatta acataataac aacattcttc cgctaaaata 540
 acataataac aacattcttc ccctaaaaat aaacagcttc cccctcttcc agaggttagc 600
 aagtctaaa gctctcaatt ttgaaggact actgatgcta ggaagttaag ttgactttgc 660
 aaggtgacca gggagtcggc aaccatttcc atgtcaccat tgagtcttgg agatagtttg 720
 tagtagaact gagtagaggt tgtggtaccg ccaatgccag aacctagtc ccactagcact 780
 cctgctocga taacaaaagg aagaatgagt actcttttgt tgtggggcct aggtacaaca 840
 taattgtata aatctgttcc agtgtaaatg gtcatggggg cactaagaat gagaggaagc 900

acatagattc tgaagagcca ttcaaacac gataggctaa ggtaccacag acaaaaaata 960
 ttcttgaggg taggcagact attcgtgtgg gaggagtac ccactgatg cattggggagt 1020
 tggttgtgtc tacagtattg ctaaaattta cacagggtgag gtttgaggta tgggtatttt 1080
 ccagattgga aacaagaggt cctactaaaa cggaagtggg gtttatttct gtgctgtagt 1140
 tgttccattg ttcaggtaca gggattgaaa tgcattggcct gaaatacagg gggaggcaca 1200
 accaacagtt agtaggggtt tggaccgaga cctcatggag ccagtgagg gtggtattaa 1260
 ataggcttac caggcaagta tgggtatgga ggggttcatg tagttttaag agatctagtc 1320
 cttttagagg gctaggggtg ctatgtaccc gggtcagttg ggaggttact tccattacat 1380
 gtttttctct tgccgtgatc tgaactccac cccctcaga cataccagta tgggtgaagt 1440
 aagtcogaca gacagtggtc ccaagtcttc caggacaact aggattaatc attttcctg 1500
 tccaataatg agtattttgca tgcattgcaa gattggcaga gttatagcag ttgtggggca 1560
 tatgggtgtg ggcagtgagg gtggagtttc ctttaggtaa actcctattt gatggggcat 1620
 caatatttct ggggaagccg attcttcata gaaactcttg gtaaggggag ctgctgggtg 1680
 acacagcaga tggagggggg gcagtgagag tgaaaggggg taagagaaca gtaagagaa 1740
 aaatatgata agggaggggc atgggggattt acgatttttag ttactttcct cagcggtgt 1799

<210> 6 <211> 1489 <212> DNA <213> Homo sapiens <400> 6
 tgggtgctgc cccgggact ctcagtctg ctgctggatc atctggttag tggcttctga 60
 ctacagaggac ctactgccc tggggcagtg ggccttacag tgattccctt gacacagagt 120
 gcatggacga gggggcggtt tatttctatt tggacaatct tttttaaggt gtccctgtag 180
 accgcactgg aagcaaaccc tattaggcat ttgatttgcc tagcttttcc cttttccagt 240
 gcctccaaag tccgcttgcc taggggcat gactaaagcg gtggcctttt ttttatccca 300
 tttgtcccat tctgctgct catcctgac tctattataa aaaactgagg ttgccaaagt 360
 caatagggtt tctaagtttt gtccgggccc taaggcagac ttttgaagtt ttttccaat 420
 gtctgtagct gactgagta taaacttato ctttaagatt agttggcctt cagtagagtc 480
 agttgacaga gagagtgatg ctctctcaat gcctccgta gtcactccag aaagcggta 540
 ggatttttct cctttccctg tgttatagtg gacatcattg aataactcac aggcctcttt 600
 ctagttttcc ttagtctctc tagcagcaa gttagcaaat gtctgcggca ccaactccca 660
 tgttctgatt ctgtgtccca gtgaggtct acactgggaa ctgctgctg gcctgtgggg 720
 aatcgttctc tttcctctgt tgtcgacct tcattgacct gactgagata ccagagatcg 780
 ccaaactctc aggcctcagt tacggcgaca cttctgtcat ttggggtag tgtctgattt 840
 agcagtaaca ttatatctct ccatatcaga tcaaaggatt gtccaaacc ttgtaaaaca 900

ccaatatagc	cattaggggt	atctgagaat	ttacctaggt	ctattttaat	ttaaagctcg	960
ggagagaaaa	aggcacatgc	actctggctg	ggccgaatcc	tcttctctcc	actgcgctcg	1020
agagagaaaa	aggtagctgc	actctggctg	ggccgaatcc	tctctccacc	gcttgagggg	1080
ggcataatcg	gggaatattg	gcattctttg	gttagttggt	taccoccttg	tctatctcct	1140
tttgaccgt	ttgggttgaa	ggggggctct	tattattttg	ggaaggagtc	tggggggatgc	1200
tggggttagg	aggtagactc	tgagggcttc	ctgtagggca	taaatcacac	tttttacata	1260
attgcgagtt	gtctcttaat	gaaaagaaag	tttgtacgtg	tgacacttca	caccatttgc	1320
cttcttttct	acaaaaggag	tctagctgtg	agatggtgtt	ataatttatg	cttccctcag	1380
gatgccagggt	ttctccctct	taaagagtat	atcgttgcca	ggcggtagctg	cagaagaata	1440
tgtctttttt	ttcttagcat	ctgagagtca	aattggtccc	aattctcca		1489

tctcctgaag gagctt

1216

<210> 8 <211> 976 <212> DNA <213> Homo sapiens <400> 8
agtgataatg gaataactga aagtaatccc ctactccag gaactagtgc tgagctggcc 60
aaactaatag ccctcactcg ggcactagaa ttaggagaag agaaaagggt aaatatatat 120
acagactata agtagctta cctagtcctt catgcccatg cagcaatatg gagagaaaag 180
gaattcctaa cttccaaagg aacacctatc aaacatcagg aagccattag gatattatta 240
ttggtggtac agaaacctaa agaggtggca gtccctacact gctggggta cagaaaaaa 300
aaggaagggt aatagaagg gaactaccaa gcagatatgt aagccaaaag agccgcaagg 360
caggaccctc cattagaaat gcttatagaa ggacccctag tgtggggtaa cccctccag 420
gaaagcaatc ccagctactc agcaggagaa ataaaatgga gaacctcag aggacatact 480
ttctccctc caggatggct agccaccaa gaaggaaaa tgcttttgcc tgcagctaac 540
aatggaat tacttaaac cttcaccaa acctttcact taggattgat agcaccatc 600
agatggccta attattattt actggatcag gccttttcaa aactatcaag caggtagtca 660
gggctgttaa agtggtccaa agaaataatc tctgcactg caagccatc atttcaatcc 720
atgtatcttt aaactcctg ttaagtttgt ctctccaga atcaaagctg taaaactaca 780
atggttctt caaatggagt ctcatgca gtccatgact aagatatacc gcagccctc 840
ggagggggcc tgctagccca tgctccaatg ttaatgacat cgaaggcacc cctccgggg 900
aaatctcaac tgcacaacc ctactatgtc ccaattcagc aggaagcagt taaagcggtc 960
tcggccaac ctccc 976

<210> 9 <211> 942 <212> DNA <213> Homo sapiens <400> 9
agaggagaac agcagcataa gcggctggca gaggtaggga aagaccagca agaagaaaaa 60
agagaaagag aaagagaaag tcagagaaag agacagagag aggaagagac aaagagacag 120
aaagtcaaag aggtagtagt cagaaacaga gacaaaaaaa aggagtcaga aagagggaca 180
gacacagaaa gtcaaaaaa aagttaagaa gaaaggaaaa gacaagaag aagtgaaga 240
ggagaaagag agagatagaa gtagtaaaga aaaaacagc atatccatt ctttaaaagc 300
cagggtaaat ttctatctac ccagccaaag catattctac ttatgtggat cttcaaccca 360
tatctgctc tcagacagtt tgcaagaaat aatgaaatct atccttactt tacaatccca 420
aatagactct ttggcagcag tgactctcca aaactgcaga ggctagacc tctcactgc 480
tgaaaaagga ggacactaca cttcttagg ggaagaatgt tgtttttaca ctaaccagtc 540
gggatagta tgagatgctg ccggagttt acaggaaaa gcttctgaaa tcagacaacg 600
cctttcaaat tcttatacca acttctggag ttaggcaaca tggcttctcc ctttctag 660

tcctgtggca gccatcttgc tgttactgc ctttgggccc tgtattttta accttcttgt	720
caaatattgtt tcctetagaa tcgaggccat caagctacag atggtcttac aaatggaacc	780
ccaaaagagt tcaactaaca acttttaccg aggacccctg gatcaacca ctggcacttc	840
ccctggccta gagagttccc ctctgaagga caccgcaact gcagggccct tctttgcccc	900
atccagcagg agtagctaga gtgtcatcg gccaaattgc ca	942
<210> 10 <211> 1375 <212> DNA <213> Homo sapiens <400> 10	
ccccaatatt ctctttctga tggggaaaaa tggccacctg agggaaagcac aaattacaat	60
actatcctgc agcttgatct tttctgtaag aggggaaggca aatggagtga aataccttat	120
gtccaagctt tcttttctatt gagggagaat acacaactat gcaaagcttg caatttacct	180
ccccagggag gacctctcag cttaccccca tatcctagcc tccctatagc ttcctctcct	240
attgatgata ctccctctct aatctccctt gcccagaagg aaataagcaa agaaatctcc	300
aaaggccac aaaaaacccc gggtatcgg ttatgtcccc ttcaagctgt agggggaggg	360
gaatttgcc caaccgggt gatgtcccc ttctccctct ctgatttaaa gcagatcagg	420
gagacctggg gaagtttcga gatgatcctg ataggtacat agatgtccta cagggtctag	480
ggcaaacctt tgacctcact tggagagacg tcatgtctact gttagatcaa accctggcct	540
ttaatgaaaa gaatcggtt ttagctgcag cctgagagtt tggagatacc tggatatcta	600
tcaagtaaa tgaagaatg acagccgaag aaagggacaa ctccctact ggtcagcaag	660
gcacccccag tatggatccc cactgggact ttgactcaga tcatggggac tggagtcgta	720
aacatctgtt gatctgtgtt ctggaaggac taaggagaat tgggaaaaag cccatgaatt	780
attcaatgat atccaccata acccaggga aggaagaaaa tctctctgcc ttcctcgagc	840
ggctacaaga ggccttaaga aaatatactc ccctgtcacc cgaatcactc gagggtaaat	900
tgattctaaa agataagttt attacccaat cagccacaga tatcaggaga aagctccaaa	960
agcaagccct gagccctgaa caaaatctag agacattatt aaacctggca accttggtgt	1020
tctataatag ggaccaagag gaacaggccc aaaaggaaaa gcgagatcag agaaaggccg	1080
cagccttagt catggccctc agacaaacaa accttggtgg ttccagagagg tcagaaaatg	1140
gagcaggcca atcacctggt acggcttggt atcagtcgcg ttactagga cactttaaaa	1200
aagattgtcc aataagaac aagctgcccc ctcatccgtg tccactatgc cgaggcaatc	1260
actggaaggt gcactgcccc agaggatgaa ggttccctgg gttagaagcc cccaaccaga	1320
tgatccaaca acaggactga ggtgccccg ggcaagcacc agctcatgtc atcac	1375
<210> 11 <211> 944 <212> DNA <213> Homo sapiens <400> 11	
acctaggagg aactgtcttc aggacaggac tatagatgct tctctccagg cgattaaggg	60

```

"aaaaagacac aatgggtatt cagtaagtga taaggaaact cttgtagaag cagagttagg 120
aaaaattgect aataattggt ctgctcaaat gtgcgagctg tttgactca gccaaacctt 180
aaaagtatta cagaatcagg aagaagccat ctataccaat tctaagttaa tatggactga 240
acgagaactt attaatagca aagaataatt gaaatcccaa acttacaagg ttttcaacaa 300
aagcacagtt tgctaaaagt taactgtgta acatgtatta tctactacc aaaaactctc 360
aaatgatttc tcagacagtt tgcaagaac aatgaaacct atccttactc tacaatccca 420
aatagactct ttggcagcag tgactctcca aaaccaccaa ggctagacc tcctcactgc 480
tgagaaagga ggactctgca ccttcttagg ggaagattgt tgtttttaca ctaaccagtc 540
agggatagtg tgagatgcc cccagcggtt acaggaaaag gcttctgaaa tcagacacaa 600
tgcttttcaa accttatagc aacctctgga gttcggcgac tggcttttcc ccttcttagg 660
tctctgaca gccactctgc tattactcgc cttcggggccc tgtattttta acctcctcgt 720
gaaatttgtt tcctctagga tcgaggccat caagctacag atggtcttac aaatggaacc 780
gcaaatgagc tcgactaaca acttctactg aggaccctg gaccgaccca ctggcccttt 840
tactggctta aagagtttcc ctctggagga cactacaact gcaggggccc ttctttgccc 900
tctccacagg aagtttagta gagcagtcac caccaattc ccaa 944

210> 12 <211> 963 <212> DNA <213> Homo sapiens <400> 12
acaggaacc ccataatagc tccttggtcaa attctattca gctccaaactg ctaggagtgg 60
ccatttgc ctgaaccctc aaatcatggg aatgagaaat gaatttagac tgaccacagc 120
ccttatgagt ttctagctac aggggtgtat agaaccctga taaggagttt tctttgtgtg 180
tggaagatcc ttctatat ttgctccccc caactggaca ggaacttgta ctttagccta 240
catagtacct cctgtgactt atccttttca gaagaggcag tagctgtgcc cattcatgct 300
aagcttcagc cgagagcaat ctactactt cctctatttg ctggttttagg atttactacc 360
acctaggaag tggactcaca gctagatga aatctctctc caacttactc aaatccagga 420
ccaaatagac tcattagcag ctgtggttct ccgaaccagt gagcactaga tctccaatct 480
cctcactgcc gaaaggggag gaacatgcct ttttctgaac aaggaatggt gtttttatgt 540
caataaatca ggcattagtga gagatggaat taaatgactt caggatagag ctacgagact 600
acatggtggg acaaccgaaa ctacctcagg gttctcacag cctgttctcc actggcttct 660
tccattttta ggtcccttcc ttatgattat tctaggagta acctttggcc catgtctttt 720
cagttccttc atccttttgt ttcttctga atagaatcaa tgaaactaga aatgttactg 780
cagatggaac ctcatagac ttcaaccagc acctattatc aaggaccctt aaaccagcct 840
gccggcccat acccgagctg tgacacccaa accacctctc acgaggaaac ctacgtacaa 900

```

gaaccccttc tatgcccta ttcagcagga agcaattaga gtgggtcatcc tcccacaccc	960
caa	963
<210> 13 <211> 1362 <212> DNA <213> Homo sapiens <400> 13	
ccacaatatc ctcttccagg aggagaacga tggccacctg agggaagtat acactataat	60
accatcctgc aactagatct gttttgtaaa caagaaggca agtggattta ggtaccatat	120
gttcagacct ttttctcatt aagggatgat aaccacgat tgtgtaagac atgtaacctg	180
cacccacag ggagtcctca aattctaccc ccatacccgat tctctccccc ggctcctcct	240
actaatgcca aacctctctt ggcttctaca gcccaaaagg gaacaaataa aagagccttc	300
agagagccaa gagacccac tggcccctgg ctatgtcctc ttcaggctgt agggagggaa	360
tttggcccaa ccgagtaca tgttcccttt tctctctctg atctaaagca aattaaggca	420
gacttgatg aaagtctca gatgaccca atagatacgt agatggcctg ctgggtctgg	480
gacaatcttt tgacctttcc tggagagaga tcatgttatt gcttgatcag acctaacctc	540
taatgagaag aatgctgctt taacaggagc ccgagagttt ggggatacct ggtacctcag	600
taagtaagt gatagaatga catcagaaga gagcagtttc ctactggcca gcaagcagtc	660
ccagtatgg atccccactg ggacctgac tcggatcatg gggactggag tcacaaacat	720
tactgacct gtatcctaga aggtttaagg agaactagga aaaagcccat gaactattca	780
tgatgtcta ctataaccca agggaaggaa gaaaacccta ttgccttctt caaaaggctg	840
agggaggctt tgagaaaata tactccctg tcaccagatt cctcgaagg ccagttaatt	900
ttaaaggaca aattttattc tcagtcaact gcagacatta ggaaaaagct ccaaaagtta	960
tccttgggcc gagcaaaatt tggaggcatc attaaacctg gcaacctcag tgttctatca	1020
tagggaccaa gaggaacagg ccgaaaagga aaagcaggat aagagaaagg ctgcagattt	1080
agtcatgccc tcagacaacc cttagcggtt caaagaggag aaaaaatgga gcaggccaat	1140
caccagcag ggcttattat cagtgcagtt tacaaggaca ctttaacaa gattgtccaa	1200
agagaaataa gccgcctct caccatgtc cactatgcca aggtgatcac tgyaaggcac	1260
actgtcccag aggacaaagg ttctctgggc cagaagtccc caaccagatg atccagcaac	1320
aggatggagg gtgcccgagg caagcaccag ctctgttgtt ca	1362
<210> 14 <211> 945 <212> DNA <213> Homo sapiens <400> 14	
ttgcagatca atctcagact gctgtgctag caatgagtga ggctctgtgg gcattgggacc	60
ctctgagcca ggcattggat ataattgtct tgtgtgcat ttgctaagac tgttggaaata	120
gcacagtatt aggggtgggag tggcccgtat ttccaggtgc tgtctgtcac cgcttcacct	180
ggctaggaaa gagaattccc tgacccttgg ttcttcccag gtaaggcagt gcttcacctt	240

gcttcagctc acactcaggt gactgcaccc actgtcctgc cccactgtc ggacaagccc	300
cagtgcagatg aacctgggtac ctgagttgga aatgcagaaa tcacctgtct tctgcgtcac	360
tcacactggg agctgtagac tggagctgtt cctatttggc catcttgga ccatctccca	420
aatagactct ttggcagcag tgactctcca aaaccaccaa ggcctagacc tctcattgc	480
tgagaaagga ggaactctga cctcttagg ggaggagtgt tgtttttata ctgaccagtc	540
agggatggtg cgagatgcca cccgatgttt acaggaaaaa gctctgaaa tcacacaaca	600
cctttcaaac tcttatacca acctctggag ttgggcaaca tggtctctcc cctttctcgg	660
tccattgca gccactctgc tattactcgc ctccaggctg tgtattttta acctcctgt	720
caaatgtgtt tctctagaa ttgaggccgt caagctacag atggtcttac aaatgggacc	780
ccaaatgagc tcaactaaca actctcgcca aggacccctg gaccaacctg ctggcccttt	840
cactggcctt aagagttccc ctctggaggg cactacaact gcagggcccc ttctttgccc	900
ctatccagca ggaagtgtct agagcagtc tcaccaatt ccca	945

<210> 15 <211> 939 <212> DNA <213> Homo sapiens <400> 15	
agagctacct tggcaagtac tctaggagta tgggaaaatg aaaacaacaa actcacacac	60
ctattttaaca tacacaatca ggtctgccca cccagcaagg tatattcttt gtatgtggaa	120
ctgcagccta tatctgcctc cccactaact agacagccac ctgaatttta gtctttctaa	180
ctcccaacag taacattgcc ccaggaaatc agaccatac agtatccctc aaagctcaag	240
ctctgtcagt cagagccata caactaatac cctacttat agggtaagga atggctactg	300
ctacaggaac cagaatagct agtttggtta ctctattatc ctactaccac acactctcaa	360
atgatttctc agacagtgtg caagaaataa cgaaatctat ccttactcta caatcccaaa	420
tagactcctt ggcagcagtg acctccaaa acggtcagg cctagacctc ctactgcca	480
agaaaggagg actctgcatt ttcttagggg aagagtgttt ttacactaac cagtacggga	540
cagtatgaga tggcactcgg agtttacagg aaaaggcttc tgaagtcaga caatgccttt	600
caaactctat accaaactct ggagttgggc aacatggctt ccccccttc taggtccgt	660
gacagccatc ttgctattat ttgccttga gccctgtatt tttaatctcc ttttcaaatt	720
tgtttcctct ggatcgaggc catcgagcta cagatggtct tcacaaatgg aaccccaaat	780
gagctcaact aacaacttct actgaggacc cctggactaa cctgtgaccc ctttactgg	840
cctgaagaat tccccctcgg aggacactac aactgcaggg ctctctcttt gccctatcc	900
agcaggaagt agctagagct gtcattgcct aattcctaa	939

<210> 16 <211> 979 <212> DNA <213> Homo sapiens <400> 16	
agtgataatg gaatacttga aagtaatccc ctactcccc aggaactagt gctcagctgg	60

Gagaactaat agccctcact cgggtactag aatcaggaga agggaaaaag gtaaatatat 120
 atacagactc taagtgtgct tacctagtcc tccatgccca tgcagcaata tggagagaaa 180
 gggaattcct aacttccgag ggaacaccta tcaaacatca ggaagccatt aggaaattat 240
 tattggctgt acagaaacct aaagaggtgg cagttttaca ctgccggggt catcagaaaag 300
 gaaaggaaaag ggaatacaaa gggagccacc aagttgatat tgaagtcaaa agagccacaa 360
 ggctggagcc tccattagaa atgcttatag gaggaccctc agtatggggt aatccctctc 420
 gggaagccaa gccccagtag ctagccacca ataaaggaaa aatacttttg cctgcagcta 480
 ctccctccc ctccagatgg ctagccacca ataaaggaaa aatacttttg cctgcagcta 540
 accaatagaa attacttaaa acccttcac aacccctcca cttaggcatt gatagcacc 600
 atgagatggc caaattatta ttactggac caggcctttt caaaactatc aagcagatag 660
 tcagggcctg taaagtctgc caaagaaata atccctcgca ctgcaggcca tacatttcaa 720
 cccctgtatc tttaacctcc ttctaaatt tgtctcttcc agaatcaaaag ctgtaaaatt 780
 caaatagtt ctccaatagg agccacagat gcagtcocatg actaatgacc accacagacc 840
 cctggaccag cctgctagcc catgctccaa tgttaatgac atcgaaggca cccctcctg 900
 aggaatctc aactgcacaa cccctactac gccccaattc agcagaaaag agttagagtg 960
 tctcatcagcc aacctcccc 979

210> 17 <211> 1774 <212> DNA <213> Homo sapiens <400> 17
 catgctggta aaggaccgct agaattccagc agccaggacc actttctttg tggtaagaa 60
 aggtgggaaa acaggtgcag gactgctaca ctggtaagca taactaatcc gataagcaga 120
 ggtccatggg tggttacgca cctggaaaag gaataagcat taggactata gaggacactc 180
 taggactaat gtcacatgga aaatgactag ggttactggc atccctatgt tcttttttca 240
 gatgggaaat gtcccccca aggcagaaat gccctaaga tgtattcttg agaaatggga 300
 ccaatctgac catcagacac taagaaagaa atgacttata ttctctgca gtaccacctg 360
 gccacaatat cttcttcaag gggcagaaac ctggcctcct gaggggaagta taaattataa 420
 caccatctta cagctagacc tctttttag aaaagaaggc aaatggagtg aagtgcata 480
 tgtacaaact ttcttttcat taagagataa ctccaatta tgtaaaaagt gtgatttatg 540
 ccctacagga agccctcaga gtctacctcc cgacccagc aagaccccaa ctctctctcc 600
 aactaataag gacccccctt caaccacaaat ggtccaaaaa gagatagaca aaggggtaaa 660
 caatgaacca aagagtgcga atattacacg attatactcg ctccaagcag tgggaggaga 720
 atttggccca gccagcgtgc atgtaccttt ttctctctca gatttaaagc aaattaaaaa 780
 agacctaggt aaattctcag ataaccctga tggctatatt gatgttttac aagggttagg 840

ācaatccttt gatctgacat ggagagatat aatgttactg ctaaatcaga cactaaccoc 900
 aaatgaaaa agtgctgccā taacagcagc ctgagagtgt ggogaactct ggtatctcag 960
 tcaggtcaat gataggtatga caacagatga aagagaatga ttccccacag gccagcagcg 1020
 agttccagct gtagaccctc attaggacac agaatcagaa ctgggagatt ggtgccacag 1080
 acatttgcta acttgctgtc tagaaggact aaggaaaaat aggaagaagc ccatgaatta 1140
 ttcaatgatg tccctataa cacagggaaa ggaagaaaaat cctactgcct ttctggagag 1200
 actaagggaa ggattgagga agcatacctc cctgtcacct gactctatta aaggccaact 1260
 aatcttaag gataagttta tcaactcagtc agctgcagag attaagaaaa aacttcaaaa 1320
 gtatgcctta ggcccagagc aaacttaga aaccctactg aacttgycāa cctcagtttt 1380
 ttataataga gatcaggaag agcaggggaa tgggacāaat gggataaaaa aaaaaaaaaa 1440
 aggtgactgc tttagtctgt gccctcaggc aaatggactt tggaggctcc agāaaagggā 1500
 āaagctgagc aaattgaatg cctaacaggg ctgtcttcta gtgtggtcta caaggacact 1560
 ātaaaaaaga ttgtccaagt agāāacaagc tgcccccttg tccatgcccc ttatgtcaag 1620
 āgaatcactg gaaggccac tgccccagga gatgaaggtc ctctgagtca gaagccacta 1680
 āccagataat ccagcagcag gactgaggat gccagggcā agcgcagcc catgccatca 1740
 ācctcacaga gccttgggta tgcttgacca ttga 1774
 <210> 18 <211> 938 <212> DNA <213> Homo sapiens <400> 18
 tcttaggaaga actcccttca ggacaggaca atagatgggt cctcccaggt gattaaggāa 60
 āaaagacaca gtattcagta agtgataagg aaactcttgt agaagcagag ttāgāāāat 120
 āgcctaataa ttggtctgtc caaatgtgtg agttgtttgc actcagccāa atcttāaagt 180
 acttacagāa tcaggāagca gccatctata ccaattctāa gttāatattg actāaacgag 240
 gttttattag tagcāāagāa aaattāāat cccāāactta caaggttttc aactāaagt 300
 tgccāāagt taacagtgtā acatgtatta tctactatc acacactctc āaaggatttc 360
 tcagacagtt tgcaagāat aacgtaatct atccttactc tacagtccāa āatagactct 420
 ttggtagcag tgactctcca aaactgccga ggtctagacc tctcaatgc tgāgāāaggā 480
 gaactctgca cttctcttag ggaagagtg cttttttāa ctaaccagtc agggatagta 540
 tgagatactg cctgacgttt acaggāāag gcttctgāāa tcagacaacg cttttcāagc 600
 tcttatacca acctctggag ttgggcaaca tggcttctcc cctgtcaggt tctgtgtgca 660
 gccactttgc tattacttgc cttcgggccc tgtattttta acctccttgt cāāatttgtt 720
 tctcttagga tcaaggccat caagctacag atgtcttac āaatggaacc ccaaatgagc 780
 tcaactāaca acttctactg aggacactg gactgaccca ctggcccttt cactggccta 840

āagagttccc ttctggagga cactacaact gcagggcccc gtcttcaccc ctatccagca 900
 ggaagtagct agatcagta ttgcccaatt cccaacag 938

<210> 19 <211> 1308 <212> DNA <213> Homo sapiens <400> 19 60
 gatgcttgcc ccaggcaacc tcagtctgt tgttgatca ctggtcggg ggctcttggc
 ccaaagaacc ttgtctctct gaggcagtgc acctccagt gattgctca gcattgtgga 120
 catgggcaag ggggagactt gtttctcact ggacaatctt ttttaaggtg tccttccaaa 180
 ccacactggt aacaagccct accaggtgat tggcctgctc tattttctgt cctctctgaa 240
 ccaccaaggt ttgtctgtct gagggctcatg actaaggctg tggcctttct ctgactctgc 300
 ttttctcttt tggcctgttc ctcttggtac ctattataga acactgaggt tggcagggtt 360
 aacaatggct ccagattttg ttcagggcac agggctcatt ttggagcttt ctctgatata 420
 ctgcagctga ttgggtaata aacttatctt ttaggatcaa tgcactctca agagagttag 480
 gtgacagggg agtatatttc cttgaggcct cccatagccc cttaggaag gcagaaggat 540
 ttcttctctt tccttgagt ataaaagaca tcattgaaca actcatggac tttttcccaa 600
 ttctctcgtg tcctctctga acacaggta gcagatgtt acgactccag tcccatgat 660
 ttgagcttag acaccagtgg ggtccatc tgggatggc ctgctgactg gtagggaatt 720
 ttgctcttct ttggctgtc attctatcat ttacttgact aagataccaa gtatctcaa 780
 ttctctcagg tgcagctaaa gctgcattct tttcattaaa ggccagggtt tgatctaata 840
 tgcctgacatc tctccaagtg aggtcaaagg ttgocctag atccatagga catcagagaa 900
 ttgagaagggg acatacacct gatttagcca aattccctc cctctacagc ttgaagggga 960
 ttaataagcaat agcctgggga tttttgtggt cctttggaga tttctttgct tgtttccttc 1020
 tgggtggggg agattagagg aggcttatca gtaataggaa ggggagctat agggaggcta 1080
 ggatattggg gtaagctgag aggtcatctt gtgggatgta aattgcaagc ttgcatagt 1140
 tgtggatttt ccttacaatg aaaataaagc ttggacataa ggtatttcac tccatttgcc 1200
 ttccctotta cagaaaaggt caagctgcag gatagtactg taatttatac ttccctcagg 1260
 tggccatttc tcccatcag agagagaata ctggggctgg gccatagt 1308

<210> 20 <211> 711 <212> DNA <213> Homo sapiens <400> 20 60
 actgagagac aggactagct ggatttccta ggccgactaa gaatccctaa gctagctgg 120
 gaagtgacc acgtccacct ttaaacacgg ggcttgcaac ttagctcaca cctgaccaat 180
 cagagagctc actaaaatgc taattaggca aagacaggag gttaaagaat agccaatcat 240
 ctattgcctg agagcacagc aggagggaca acaatcgga tataaaccca ggcattcgag 300
 ctggcaacag cagccccctt ttgggtccct tccctttgta tgggagctgt tttcatgcta

ttctactcta ttaaatcttg caactgcact cttctggtcc atgtttctta cggtctgagc 360
 tgagcttttg ctcaccgtcc accactgctg tttgccacca cgcagacact gccgctgact 420
 cccatccctc tggatcctgc aggggtgctcg ctgtgctcct gatccagcga ggcgccatt 480
 gccgctccca attgggctaa aggcctgcca ttgttctgc acggctaagt gcttgggttt 540
 gttctaattg agctgaacac tagtcaactgg gttccatggt tctcttctgt gacccaagcg 600
 ttctaataga actataacac ttaccacatg gcccaagatt ccattccttg gaatccgtga 660
 ggccaagaac tccaggtcag agaatacagag gcttgccacc atcttgggaag c 711

<210> 21 <211> 711 <212> DNA <213> Homo sapiens <400> 21
 actgagagac aggactagct ggatttccta ggctgactaa gaatccctaa gcctagctgg 60
 gaaggtgacc acatccacct ttaaacacgg ggcttgcaac ttgctcaca cctgaccaat 120
 cagagagctc actaaaatgc taattagcca aagacaggag gtaaagaat agccaatcat 180
 ctattgcctg agagcacagc agggaggaca atgatcgga tataaaccga agtcttcgag 240
 dcggcaacgg caaccccctt tgggtccctt ccttttctat gggagctctg ttttcatgct 300
 atttactct attaaatctt gcaactgcac tcttctggtc catgtttctt acggcttgag 360
 ctgagcttct gctgcgcac caccactgct gtttgccgcc accgcagacc cgccgctgac 420
 tcccatccct ctggatcatg cagggtgtcc gctgtgctcc tgatccagcg aggcacccat 480
 cgccgctccc aatcgggcta aaggcttgcc attgttctct catggctaag tgcttgggtt 540
 cgtcctaatt gagctgaaca ctagtcaactg ggttccatgg ttctcttctg tgacccacag 600
 ttcttaatag agctataaca ctacacgat gcccaaggt tccattcctt gaatccataa 660
 ggccaagaac cccaggtcag agaacacgag gcttgccacc atcttgggag c 711

<210> 22 <211> 2055 <212> DNA <213> Homo sapiens <220> <221> CDS <222> (1)..(2055)
 <223>

<400> 22
 ccc aag aca gcc aac tta gtt gca gac atc acc tcc tta gcc aaa tat 48
 Pro Lys Thr Ala Asn Leu Val Ala Asp Ile Thr Ser Leu Ala Lys Tyr
 1 5 10 15

caa caa gtt ctt aaa aca tta caa gga acc tat ccc tga gaa gag gga 96
 Gln Gln Val Leu Lys Thr Leu Gln Gly Thr Tyr Pro Glu Glu Gly
 20 25 30

aaa gaa cta ttc cac cct tgt gac atg gta tta gtc aag tcc ctt ccc 144
 Lys Glu Leu Phe His Pro Cys Asp Met Val Leu Val Lys Ser Leu Pro
 35 40 45

tct aat tcc cca tcc cta gat aca tcc tgg gaa gga ccc tac cca gtc 192
 Ser Asn Ser Pro Ser Leu Asp Thr Ser Trp Glu Gly Pro Tyr Pro Val
 50 55 60

att tta tct acc cca act gcg gtt aaa gtg gct gga gtg gag tct tgg 240

Ile	Leu	Ser	Thr	Pro	Thr	Ala	Val	Lys	Val	Ala	Gly	Val	Glu	Ser	Trp	
65						70					75					
ata	cat	cac	act	tga	gtc	aaa	tcc	tg	ata	ctg	cca	aag	gaa	cct	gaa	288
Ile	His	His	Thr		Val	Lys	Ser	Trp	Ile	Leu	Pro	Lys	Glu	Pro	Glu	
80						85					90					
aat	cca	gga	gac	aac	gct	agc	tat	tcc	tgt	gaa	cct	cta	gag	gat	ttg	336
Asn	Pro	Gly	Asp	Asn	Ala	Ser	Tyr	Ser	Cys	Glu	Pro	Leu	Glu	Asp	Leu	
95					100					105					110	
cgc	ctg	ctc	ttc	aaa	caa	caa	cca	gga	gga	aag	taa	cta	aaa	tca	taa	384
Arg	Leu	Leu	Phe	Lys	Gln	Gln	Pro	Gly	Gly	Lys		Leu	Lys	Ser		
				115					120							
atc	ccc	atg	gcc	ctc	cct	tat	cat	att	ttt	ctc	ttt	act	gtt	ctt	tta	432
Ile	Pro	Met	Ala	Leu	Pro	Tyr	His	Ile	Phe	Leu	Phe	Thr	Val	Leu	Leu	
125					130					135					140	
ccc	tct	ttc	act	ctc	act	gca	ccc	cct	cca	tgc	cgc	tgt	atg	acc	agt	480
Pro	Ser	Phe	Thr	Leu	Thr	Ala	Pro	Pro	Pro	Cys	Arg	Cys	Met	Thr	Ser	
				145					150					155		
agc	tcc	cct	tac	caa	gag	ttt	cta	tg	aga	atg	cag	cgt	ccc	gga	aat	528
Ser	Ser	Pro	Tyr	Gln	Glu	Phe	Leu	Trp	Arg	Met	Gln	Arg	Pro	Gly	Asn	
				160				165					170			
att	gat	gcc	cca	tcg	tat	agg	agt	ctt	tct	aag	gga	acc	ccc	acc	ttc	576
Ile	Asp	Ala	Pro	Ser	Tyr	Arg	Ser	Leu	Ser	Lys	Gly	Thr	Pro	Thr	Phe	
		175					180					185				
act	gcc	cac	acc	cat	atg	ccc	cgc	aac	tgc	tat	cac	tct	gcc	act	ctt	624
Thr	Ala	His	Thr	His	Met	Pro	Arg	Asn	Cys	Tyr	His	Ser	Ala	Thr	Leu	
		190				195					200					
gac	atg	cat	gca	aat	act	cat	tat	tg	aca	gga	aaa	atg	att	aat	cct	672
Cys	Met	His	Ala	Asn	Thr	His	Tyr	Trp	Thr	Gly	Lys	Met	Ile	Asn	Pro	
		205			210					215					220	
agt	tgt	cct	gga	gga	ctt	gga	gtc	act	gtc	tgt	tg	act	tac	ttc	acc	720
Ser	Cys	Pro	Gly	Gly	Leu	Gly	Val	Thr	Val	Cys	Trp	Thr	Tyr	Phe	Thr	
				225					230					235		
caa	act	ggt	atg	tct	gat	ggg	ggt	gga	gtt	caa	gat	cag	gca	aga	gaa	768
Gln	Thr	Gly	Met	Ser	Asp	Gly	Gly	Gly	Val	Gln	Asp	Gln	Ala	Arg	Glu	
				240				245					250			
aaa	cat	gta	aaa	gaa	gta	atc	tcc	caa	ctc	acc	cgg	gta	cat	ggc	acc	816
Lys	His	Val	Lys	Glu	Val	Ile	Ser	Gln	Leu	Thr	Arg	Val	His	Gly	Thr	
		255				260						265				
tct	agc	ccc	tac	aaa	gga	cta	gat	ctc	tca	aaa	cta	cat	gaa	acc	ctc	864
Ser	Ser	Pro	Tyr	Lys	Gly	Leu	Asp	Leu	Ser	Lys	Leu	His	Glu	Thr	Leu	
		270				275					280					
cgt	acc	cat	act	cgc	ctg	gta	agc	cta	ttt	aat	acc	acc	ctc	act	ggg	912
Arg	Thr	His	Thr	Arg	Leu	Val	Ser	Leu	Phe	Asn	Thr	Thr	Leu	Thr	Gly	
		285			290					295					300	
ctc	cat	gag	gtc	tcg	gcc	caa	aac	cct	act	aac	tgt	tg	ata	tgc	ctc	960
Leu	His	Glu	Val	Ser	Ala	Gln	Asn	Pro	Thr	Asn	Cys	Trp	Ile	Cys	Leu	
				305					310					315		

cgc ctg aac ttc agg cca tat gtt tca atc cct gta cct gaa caa tgg Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp 320 325 330	1008
aac aac ttc agc aca gaa ata aac acc act tcc gtt tta gta gga cct Asn Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro 335 340 345	1056
ctt gtt tcc aat ctg gaa ata acc cat acc tca aac ctc acc tgt gta Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val 350 355 360	1104
aaa ttt agc aat act aca tac aca aac tcc caa tgc atc agg tgg Lys Phe Ser Asn Thr Thr Thr Asn Ser Glu Cys Ile Arg Trp 365 370 375 380	1152
gta act cct ccc aca caa ata gtc tgc cta ccc tca gga ata ttt ttt Val Thr Pro Pro Thr Gln Ile Val Leu Ser Gly Ile Phe Phe 385 390 395	1200
gtc tgt ggt acc tca gcc tat cgt tgt ttg aat ggc tct tca gaa tct Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Glu Ser 400 405 410	1248
atg tgc ttc ctc tca ttc tta gtg ccc cct atg acc atc tac act gaa Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu 415 420 425	1296
caa gat tta tac agt tat gtc ata tct aag ccc cgc aac aaa aga gta Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val 430 435 440	1344
ccc att ctt cct ttt gtt ata gga gca gga gtg cta ggt gca cta ggt Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly 445 450 455 460	1392
act ggc att ggc ggt atc aca acc tct act cag ttc tac tac aaa cta Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu 465 470 475	1440
tct caa gaa cta aat ggg gac atg gaa cgg gtc gcc gac tcc ctg gtc Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val 480 485 490	1488
acc ttg caa gat caa ctt aac tcc cta gca gca gta gtc ctt caa aat Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Val Leu Gln Asn 495 500 505	1536
cga aga gct tta gac ttg cta acc gct gaa aga ggg gga acc tgt tta Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu 510 515 520	1584
ttt tta ggg gaa gaa tgc tgt tat tat gtt aat caa tcc gga atc gtc Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val 525 530 535 540	1632
act gag aaa gtt aaa gaa att cga gat cga ata caa cgt aga gca gag Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu 545 550 555	1680
gag ctt cga aac act gga ccc tgg ggc ctc ctc agc caa tgg atg ccc Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro 560 565 570	1728

	560	565	570	
	tgg att ctc ccc ttc tta gga cct cta gca gct ata ata ttg cta ctc			1776
	Trp Ile Leu Pro Phe Leu Gly	Pro Leu Ala Ala Ile Ile Leu Leu Leu		
	575	580	585	
	ctc ttt gga ccc tgt atc ttt aac ctc ctt gtt aac ttt gtc tct tcc			1824
	Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser			
	590	595	600	
	aga atc gaa gct gta aaa cta caa atg gag ccc aag atg cag tcc aag			1872
	Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys			
	605	610	615	620
	act aag atc tac cgc aga ccc ctg gac cgg cct gct agc cca cga tct			1920
	Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser			
	625	630	635	
	gat gtt aat gac atc aaa ggc acc cct cct gag gaa atc tca gct gca			1968
	Asp Val Asn Asp Ile Lys Gly Thr	Pro Pro Glu Glu Ile Ser Ala Ala		
	640	645	650	
	gaa cct cta cta cgc ccc aat tca gca gga agc agt tag agc ggt cgt			2016
	Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser			
	655	660	665	
	ggg cca acc tcc cca aca gca ctt agg ttt tcc tgt tga			2055
	Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys			
	670	675		
<210>	23 <211>	28 <212>	PRT <213>	Homo sapiens <400> 23
Pro Lys Thr Ala Asn Leu Val Ala Asp	Ile Thr Ser Leu Ala Lys Tyr			
5	10	15		
Gln Gln Val Leu Lys Thr Leu Gln Gly Thr Tyr Pro				
20	25			
<210>	24 <211>	55 <212>	PRT <213>	Homo sapiens <400> 24
Glu Glu Gly Lys	Glu Leu Phe His Pro Cys Asp Met Val Leu Val Lys			
1	5	10	15	
Ser Leu Pro Ser Asn Ser Pro Ser Leu Asp Thr Ser Trp Glu Gly Pro				
20	25	30		
Tyr Pro Val Ile Leu Ser Thr Pro Thr Ala Val Lys Val Ala Gly Val				
35	40	45		
Glu Ser Trp Ile His His Thr				
50	55			
<210>	25 <211>	38 <212>	PRT <213>	Homo sapiens <400> 25
Val Lys Ser Trp Ile Leu Pro Lys Glu Pro Glu Asn Pro Gly Asp Asn				

1 5 10 15

Ala Ser Tyr Ser Cys Glu Pro Leu Glu Asp Leu Arg Leu Leu Phe Lys
20 25 30

Gln Gln Pro Gly Gly Lys
35

<210> 26 <211> 540 <212> PRT <213> Homo sapiens <400> 26

Ile Pro Met Ala Leu Pro Tyr His Ile Phe Leu Phe Thr Val Leu Leu
1 5 10 15

Pro Ser Phe Thr Leu Thr Ala Pro Pro Pro Cys Arg Cys Met Thr Ser
20 25 30

Ser Ser Pro Tyr Gln Glu Phe Leu Trp Arg Met Gln Arg Pro Gly Asn
35 40 45

Ile Asp Ala Pro Ser Tyr Arg Ser Leu Ser Lys Gly Thr Pro Thr Phe
50 55 60

Thr Ala His Thr His Met Pro Arg Asn Cys Tyr His Ser Ala Thr Leu
65 70 75 80

Cys Met His Ala Asn Thr His Tyr Trp Thr Gly Lys Met Ile Asn Pro
85 90 95

Ser Cys Pro Gly Gly Leu Gly Val Thr Val Cys Trp Thr Tyr Phe Thr
100 105 110

Gln Thr Gly Met Ser Asp Gly Gly Gly Val Gln Asp Gln Ala Arg Glu
115 120 125

Lys His Val Lys Glu Val Ile Ser Gln Leu Thr Arg Val His Gly Thr
130 135 140

Ser Ser Pro Tyr Lys Gly Leu Asp Leu Ser Lys Leu His Glu Thr Leu
145 150 155 160

Arg Thr His Thr Arg Leu Val Ser Leu Phe Asn Thr Thr Leu Thr Gly
165 170 175

Leu His Glu Val Ser Ala Gln Asn Pro Thr Asn Cys Trp Ile Cys Leu
180 185 190

Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp

	195		200		205
Asn	Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro				
210		215		220	
Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val					
225	230		235		240
Lys Phe Ser Asn Thr Thr Tyr Thr Thr Asn Ser Gln Cys Ile Arg Trp					
	245		250		255
Val Thr Pro Pro Thr Gln Ile Val Cys Leu Pro Ser Gly Ile Phe Phe					
	260		265		270
Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Ser Glu Ser					
	275		280		285
Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu					
290		295		300	
Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val					
305		310		315	320
Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly					
	325		330		335
Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu					
	340		345		350
Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val					
	355		360		365
Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Leu Gln Asn					
	370		375		380
Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu					
385	390		395		400
Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val					
	405		410		415
Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu					
	420		425		430
Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro					
	435		440		445

Trp Ile Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile Ile Leu Leu Leu
450 455 460

Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser
465 470 475 480

Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys
485 490 495

Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser
500 505 510

Asp Val Asn Asp Ile Lys Gly Thr Pro Pro Glu Glu Ile Ser Ala Ala
515 520 525

Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser
530 535 540

<210> 27 <211> 15 <212> PRT <213> Homo sapiens <400> 27

Ser Gly Arg Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys
5 10 15

<210> 28 <211> 1080 <212> DNA <213> Homo sapiens <220> <221> CDS <222> (1)..(1080)
<223>

<400> 28
acc tct ttt gta gaa aag gca aat gga gtg aag tgc cat aag tac aaa 48
Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
5 10 15

ttt tct ttt cat taa gag aca act cac aat tat gta aaa agt gtg att 96
Leu Ser Phe His Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
20 25 30

tat gcc cta cag gaa gcc ttc aga gtc tac ctc cct atc cca gca tcc 144
Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser
35 40 45

cgc act cct tcc cca act aat aag gac ccc cct tca acc caa atg gtc 192
Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val
50 55 60

caa aag gag ata gac aaa agg gta aac agt gaa cca aag agt gcc aat 240
Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn
65 70 75

att ccc caa tta tga ccc ctc caa gca gtg gga gga aga gaa ttc ggc 288
Ile Pro Gln Leu Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly
80 85 90

cca gcc aga gtg cat gtg cct ttt tct ctc cca gac tta aag caa ata 336
Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile
95 100 105 110

aaa aca gac tta ggt aaa ttc tca gat aac cct gat ggc tat att gat Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp 115 120 125	384
gtt tta caa ggg tta gga caa ttc ttt gat ctg aca tgg aga gat ata Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile 130 135 140	432
atg tca ctg cta aat cag aca cta acc cca aat gag aga agt gcc acc Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr 145 150 155	480
ata act gca gcc tga gag ttt ggc gat ctg tgg tat ctg agt cag gtc Ile Thr Ala Ala Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val 160 165 170	528
aat gat agg atg aca aca gag gaa aga gaa tga ttc ccc aca ggc cag Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Phe Pro Thr Gly Gln 175 180 185	576
cag gca gtt ccc agt cta gac cct cat tgg gac aca gaa tca gaa cat Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu His 190 195 200	624
aga gat tgg tgc tgc aga cat ttg cta act tgt gtg cta gaa gga cta Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly Leu 205 210 215 220	672
agg aaa act agg aag aag tct atg aat tac tca atg atg tcc acc ata Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr Ile 225 230 235	720
aca cag gga agg gaa gaa aat cct act gcc ttt ctg gag aga cta agg Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu Arg 240 245 250	768
gag gca ttg agg aag cgt gcc tct ctg tca cct gac tct tct gaa ggc Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu Gly 255 260 265	816
caa cta atc tta aag cgt aag ttt atc act cag tca gct gca gac att Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp Ile 270 275 280	864
aga aaa aaa ctt caa aag tct gcc gta ggc ccg gag caa aac tta gaa Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu Glu 285 290 295 300	912
acc cta ttg aac ttg gca acc tcg gtt ttt tat aat aga gat cag gag Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln Glu 305 310 315	960
gag cag gcg gaa cag gac aaa cgg gat taa aaa aaa ggc cac cgc ttt Glu Gln Ala Glu Gln Asp Lys Arg Asp Lys Lys Gly His Arg Phe 320 325 330	1008
agt cat gac cct cag gca agt gga ctt tgg agg ctg tgg aaa agg gaa Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg Glu 335 340 345	1056
aag ctg ggc aaa ttg aat gcc taa Lys Leu Gly Lys Leu Asn Ala	1080

350

<210> 29 <211> 20 <212> PRT <213> Homo sapiens <400> 29

Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
1 5 10 15

Leu Ser Phe His
20

<210> 30 <211> 63 <212> PRT <213> Homo sapiens <400> 30

Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile Tyr Ala Leu Gln Glu
1 5 10 15

Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser Pro Thr Pro Ser Pro
20 25 30

Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val Gln Lys Glu Ile Asp
35 40 45

Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn Ile Pro Gln Leu
50 55 60

<210> 31 <211> 79 <212> PRT <213> Homo sapiens <400> 31

Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly Pro Ala Arg Val His
5 10 15

Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile Lys Thr Asp Leu Gly
20 25 30

Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp Val Leu Gln Gly Leu
35 40 45

Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile Met Ser Leu Leu Asn
50 55 60

Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr Ile Thr Ala Ala
65 70 75

<210> 32 <211> 21 <212> PRT <213> Homo sapiens <400> 32

Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val Asn Asp Arg Met Thr
1 5 10 15

Thr Glu Glu Arg Glu
20

```

<210> 33 <211> 142 <212> PRT <213> Homo sapiens <400> 33
Phe Pro Thr Gly Gln Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp
1 5 10 15
Thr Glu Ser Glu His Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys
20 25 30
Val Leu Glu Gly Leu Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser
35 40 45
Met Met Ser Thr Ile Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe
50 55 60
Leu Glu Arg Leu Arg Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro
65 70 75 80
Asp Ser Ser Glu Gly Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln
85 90 95
Ser Ala Ala Asp Ile Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro
100 105 110
Glu Gln Asn Leu Glu Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr
115 120 125
Asn Arg Asp Gln Glu Glu Gln Ala Glu Gln Asp Lys Arg Asp
130 135 140

```

```

<210> 34 <211> 29 <212> PRT <213> Homo sapiens <400> 34
Lys Lys Gly His Arg Phe Ser His Asp Pro Gln Ala Ser Gly Leu Trp
1 5 10 15
Arg Leu Trp Lys Arg Glu Lys Leu Gly Lys Leu Asn Ala
20 25

```

```

<210> 35 <211> 685 <212> PRT <213> Homo sapiens <220> <221> misc_feature <222>
(29)..(29) <223> Xaa is any amino acid

```

```

<220> <221> misc_feature <222> (85)..(85) <223> Xaa is any amino acid
<220> <221> misc_feature <222> (124)..(124) <223> Xaa is any amino acid
<220> <221> misc_feature <222> (128)..(128) <223> Xaa is any amino acid
<220> <221> misc_feature <222> (669)..(669) <223> Xaa is any amino acid
<220> <221> misc_feature <222> (685)..(685) <223> Xaa is any amino acid
<400> 35

```

Pro Lys Thr Ala Asn Leu Val Ala Asp Ile Thr Ser Leu Ala Lys Tyr
 1 5 10 15
 Gln Gln Val Leu Lys Thr Leu Gln Gly Thr Tyr Pro Xaa Glu Glu Gly
 20 25 30
 Lys Glu Leu Phe His Pro Cys Asp Met Val Leu Val Lys Ser Leu Pro
 35 40 45
 Ser Asn Ser Pro Ser Leu Asp Thr Ser Trp Glu Gly Pro Tyr Pro Val
 50 55 60
 Ile Leu Ser Thr Pro Thr Ala Val Lys Val Ala Gly Val Glu Ser Trp
 65 70 75 80
 Ile His His Thr Xaa Val Lys Ser Trp Ile Leu Pro Lys Glu Pro Glu
 85 90 95
 Asn Pro Gly Asp Asn Ala Ser Tyr Ser Cys Glu Pro Leu Glu Asp Leu
 100 105 110
 Arg Leu Leu Phe Lys Gln Gln Pro Gly Gly Lys Xaa Leu Lys Ser Xaa
 115 120 125
 Ile Pro Met Ala Leu Pro Tyr His Ile Phe Leu Phe Thr Val Leu Leu
 130 135 140
 Pro Ser Phe Thr Leu Thr Ala Pro Pro Pro Cys Arg Cys Met Thr Ser
 145 150 155 160
 Ser Ser Pro Tyr Gln Glu Phe Leu Trp Arg Met Gln Arg Pro Gly Asn
 165 170 175
 Ile Asp Ala Pro Ser Tyr Arg Ser Leu Ser Lys Gly Thr Pro Thr Phe
 180 185 190
 Thr Ala His Thr His Met Pro Arg Asn Cys Tyr His Ser Ala Thr Leu
 195 200 205
 Cys Met His Ala Asn Thr His Tyr Trp Thr Gly Lys Met Ile Asn Pro
 210 215 220
 Ser Cys Pro Gly Gly Leu Gly Val Thr Val Cys Trp Thr Tyr Phe Thr
 225 230 235 240
 Gln Thr Gly Met Ser Asp Gly Gly Gly Val Gln Asp Gln Ala Arg Glu
 245 250 255

Lys His Val Lys Glu Val Ile Ser Gln Leu Thr Arg Val His Gly Thr
 260 265 270

Ser Ser Pro Tyr Lys Gly Leu Asp Leu Ser Lys Leu His Glu Thr Leu
 275 280 285

Arg Thr His Thr Arg Leu Val Ser Leu Phe Asn Thr Thr Leu Thr Gly
 290 295 300

Leu His Glu Val Ser Ala Gln Asn Pro Thr Asn Cys Trp Ile Cys Leu
 305 310 315 320

Pro Leu Asn Phe Arg Pro Tyr Val Ser Ile Pro Val Pro Glu Gln Trp
 325 330 335

Asn Asn Phe Ser Thr Glu Ile Asn Thr Thr Ser Val Leu Val Gly Pro
 340 345 350

Leu Val Ser Asn Leu Glu Ile Thr His Thr Ser Asn Leu Thr Cys Val
 355 360 365

Lys Phe Ser Asn Thr Thr Tyr Thr Thr Asn Ser Gln Cys Ile Arg Trp
 370 375 380

Val Thr Pro Pro Thr Gln Ile Val Cys Leu Pro Ser Gly Ile Phe Phe
 385 390 395 400

Val Cys Gly Thr Ser Ala Tyr Arg Cys Leu Asn Gly Ser Ser Glu Ser
 405 410 415

Met Cys Phe Leu Ser Phe Leu Val Pro Pro Met Thr Ile Tyr Thr Glu
 420 425 430

Gln Asp Leu Tyr Ser Tyr Val Ile Ser Lys Pro Arg Asn Lys Arg Val
 435 440 445

Pro Ile Leu Pro Phe Val Ile Gly Ala Gly Val Leu Gly Ala Leu Gly
 450 455 460

Thr Gly Ile Gly Gly Ile Thr Thr Ser Thr Gln Phe Tyr Tyr Lys Leu
 465 470 475 480

Ser Gln Glu Leu Asn Gly Asp Met Glu Arg Val Ala Asp Ser Leu Val
 485 490 495

Thr Leu Gln Asp Gln Leu Asn Ser Leu Ala Ala Val Val Leu Gln Asn

5

```

500                               505                               510
Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly Thr Cys Leu
515                               520                               525

Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val
530                               535                               540

Thr Glu Lys Val Lys Glu Ile Arg Asp Arg Ile Gln Arg Arg Ala Glu
545                               550                               555                               560

Glu Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu Ser Gln Trp Met Pro
565                               570                               575

Trp Ile Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile Ile Leu Leu Leu
580                               585                               590

Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu Val Asn Phe Val Ser Ser
595                               600                               605

Arg Ile Glu Ala Val Lys Leu Gln Met Glu Pro Lys Met Gln Ser Lys
610                               615                               620

Thr Lys Ile Tyr Arg Arg Pro Leu Asp Arg Pro Ala Ser Pro Arg Ser
625                               630                               635                               640

Asp Val Asn Asp Ile Lys Gly Thr Pro Pro Glu Glu Ile Ser Ala Ala
645                               650                               655

Gln Pro Leu Leu Arg Pro Asn Ser Ala Gly Ser Ser Xaa Ser Gly Arg
660                               665                               670

Arg Pro Thr Ser Pro Thr Ala Leu Arg Phe Ser Cys Xaa
675                               680                               685

```

```

<210> 36 <211> 360 <212> PRT <213> Homo sapiens <220> <221> misc_feature <222>
(21)..(21) <223> Xaa is any amino acid

<220> <221> misc_feature <222> (85)..(85) <223> Xaa is any amino acid

<220> <221> misc_feature <222> (165)..(165) <223> Xaa is any amino acid

<220> <221> misc_feature <222> (187)..(187) <223> Xaa is any amino acid

<220> <221> misc_feature <222> (330)..(330) <223> Xaa is any amino acid

<220> <221> misc_feature <222> (360)..(360) <223> Xaa is any amino acid

<400> 36

```

Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
 1 5 10 15
 Leu Ser Phe His Xaa Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
 20 25 30
 Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Pro Ala Ser
 35 40 45
 Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met Val
 50 55 60
 Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala Asn
 65 70 75 80
 Ile Pro Gln Leu Xaa Pro Leu Gln Ala Val Gly Gly Arg Glu Phe Gly
 85 90 95
 Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln Ile
 100 105 110
 Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile Asp
 115 120 125
 Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp Ile
 130 135 140
 Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala Thr
 145 150 155 160
 Ile Thr Ala Ala Xaa Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln Val
 165 170 175
 Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Xaa Phe Pro Thr Gly Gln
 180 185 190
 Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu His
 195 200 205
 Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly Leu
 210 215 220
 Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr Ile
 225 230 235 240
 Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu Arg
 245 250 255

Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu Gly
260 265 270

Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp Ile
275 280 285

Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu Glu
290 295 300

Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln Glu
305 310 315 320

Glu Gln Ala Glu Gln Asp Lys Arg Asp Xaa Lys Lys Gly His Arg Phe
325 330 335

Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg Glu
340 345 350

Lys Leu Gly Lys Leu Asn Ala Xaa
355 360

<210> 37 <211> 26 <212> DNA <213> Homo sapiens <400> 37 26
ggaccataga ggacactcca ggacta

<210> 38 <211> 25 <212> DNA <213> Homo sapiens <400> 38 25
cctcagtcct gctgctggat catct

<210> 39 <211> 27 <212> DNA <213> Homo sapiens <400> 39 27
cctccaagca gtgggaggaa gagaatt

<210> 40 <211> 28 <212> DNA <213> Homo sapiens <400> 40 28
ccttccctgt gttattgtgg acatcatt

<210> 41 <211> 30 <212> DNA <213> Homo sapiens <400> 41 30
ggaagaagtc tatgaattat tcaatgatgt

<210> 42 <211> 27 <212> DNA <213> Homo sapiens <400> 42 27
gggacacaga atcagaacat ggagatt

<210> 43 <211> 27 <212> DNA <213> Homo sapiens <400> 43 27
gccttcagaa gagtcagggtg acagaga

<210> 44 <211> 25 <212> DNA <213> Homo sapiens <400> 44 25
gagcctccaa agtccacttg cctga

<210> 45 <211> 29 <212> DNA <213> Homo sapiens <400> 45

gatttcagta tctactagtc tgggtagat	29
<210> 46 <211> 27 <212> DNA <213> Homo sapiens <400> 46	27
ctaggaaatc cagctagtc tgtctca	
<210> 47 <211> 28 <212> DNA <213> Homo sapiens <400> 47	28
ccaagacagc caacttagtt gcagacat	
<210> 48 <211> 28 <212> DNA <213> Homo sapiens <400> 48	28
ggacgctgca ttctccatag aaactctt	
<210> 49 <211> 29 <212> DNA <213> Homo sapiens <400> 49	29
gcaatactac atacacaacc aactccaa	
<210> 50 <211> 26 <212> DNA <213> Homo sapiens <400> 50	26
gggggaggca tatccaacag ttagta	
<210> 51 <211> 30 <212> DNA <213> Homo sapiens <400> 51	30
ccatctacac tgaacaagat ttatacact	
<210> 52 <211> 28 <212> DNA <213> Homo sapiens <400> 52	28
atgcccagta cctagtgcac ctgacact	
<210> 53 <211> 31 <212> DNA <213> Homo sapiens <400> 53	31
cggaatacaac gtagagcaga ggagcttcga a	
<210> 54 <211> 28 <212> DNA <213> Homo sapiens <400> 54	28
agcccaagat gcagtccaag actaagat	
<210> 55 <211> 27 <212> DNA <213> Homo sapiens <400> 55	27
gcgtagtaga ggttgtgcag ctgagat	
<210> 56 <211> 27 <212> DNA <213> Homo sapiens <400> 56	27
cccttaccaa gagtttctat ggagaat	
<210> 57 <211> 27 <212> DNA <213> Homo sapiens <400> 57	27
accgctctaa ctgcttctctg ctgaatt	
<210> 58 <211> 420 <212> PRT <213> Homo sapiens <220> <221> misc_feature <222>	
(21)..(21) <223> Xaa is any amino acid	
<220> <221> misc_feature <222> (86)..(86) <223> Xaa is any amino acid	
<220> <221> misc_feature <222> (166)..(166) <223> Xaa is any amino acid	
<220> <221> misc_feature <222> (188)..(188) <223> Xaa is any amino acid	
<220> <221> misc_feature <222> (331)..(331) <223> Xaa is any amino acid	

<220> <221> misc_feature <222> (361)..(361) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (362)..(362) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (374)..(374) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (380)..(380) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (382)..(382) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (408)..(408) <223> Xaa is any amino acid
 <220> <221> misc_feature <222> (413)..(413) <223> Xaa is any amino acid
 <400> 58

Thr Ser Phe Val Glu Lys Ala Asn Gly Val Lys Cys His Lys Tyr Lys
 1 5 10 15

Leu Ser Phe His Xaa Glu Thr Thr His Asn Tyr Val Lys Ser Val Ile
 20 25 30

Tyr Ala Leu Gln Glu Ala Phe Arg Val Tyr Leu Pro Ile Leu Pro Ala
 35 40 45

Ser Pro Thr Pro Ser Pro Thr Asn Lys Asp Pro Pro Ser Thr Gln Met
 50 55 60

Val Gln Lys Glu Ile Asp Lys Arg Val Asn Ser Glu Pro Lys Ser Ala
 65 70 75 80

Asn Ile Pro Gln Leu Xaa Pro Leu Gln Ala Val Gly Gly Arg Glu Phe
 85 90 95

Gly Pro Ala Arg Val His Val Pro Phe Ser Leu Pro Asp Leu Lys Gln
 100 105 110

Ile Lys Thr Asp Leu Gly Lys Phe Ser Asp Asn Pro Asp Gly Tyr Ile
 115 120 125

Asp Val Leu Gln Gly Leu Gly Gln Phe Phe Asp Leu Thr Trp Arg Asp
 130 135 140

Ile Met Ser Leu Leu Asn Gln Thr Leu Thr Pro Asn Glu Arg Ser Ala
 145 150 155 160

Thr Ile Thr Ala Ala Xaa Glu Phe Gly Asp Leu Trp Tyr Leu Ser Gln
 165 170 175

Val Asn Asp Arg Met Thr Thr Glu Glu Arg Glu Xaa Phe Pro Thr Gly
 180 185 190

Gln Gln Ala Val Pro Ser Leu Asp Pro His Trp Asp Thr Glu Ser Glu
 195 200 205
 His Gly Asp Trp Cys Cys Arg His Leu Leu Thr Cys Val Leu Glu Gly
 210 215 220
 Leu Arg Lys Thr Arg Lys Lys Ser Met Asn Tyr Ser Met Met Ser Thr
 225 230 235 240
 Ile Thr Gln Gly Arg Glu Glu Asn Pro Thr Ala Phe Leu Glu Arg Leu
 245 250 255
 Arg Glu Ala Leu Arg Lys Arg Ala Ser Leu Ser Pro Asp Ser Ser Glu
 260 265 270
 Gly Gln Leu Ile Leu Lys Arg Lys Phe Ile Thr Gln Ser Ala Ala Asp
 275 280 285
 Ile Arg Lys Lys Leu Gln Lys Ser Ala Val Gly Pro Glu Gln Asn Leu
 290 295 300
 Glu Thr Leu Leu Asn Leu Ala Thr Ser Val Phe Tyr Asn Arg Asp Gln
 305 310 315 320
 Glu Glu Gln Ala Glu Gln Asp Lys Arg Asp Xaa Lys Lys Gly His Arg
 325 330 335
 Phe Ser His Asp Pro Gln Ala Ser Gly Leu Trp Arg Leu Trp Lys Arg
 340 345 350
 Glu Lys Leu Gly Lys Leu Asn Ala Xaa Xaa Gly Leu Leu Pro Val Arg
 355 360 365
 Ser Thr Arg Thr Leu Xaa Lys Arg Leu Ser Lys Xaa Lys Xaa Ala Ala
 370 375 380
 Pro Ser Ser Met Pro Leu Ile Ser Arg Glu Ser Leu Glu Gly Pro Leu
 385 390 395 400
 Pro Gln Gly Thr Lys Val Leu Xaa Val Arg Ser His Xaa Pro Asp Ser
 405 410 415
 Ser Ser Arg Thr
 420

<210> 59 <211> 32 <212> DNA <213> Homo sapiens <400> 59

Taaactacaa atggttcttc aatggagcc ca 32

<210> 60 <211> 32 <212> DNA <213> Homo sapiens <400> 60
gatgcagtc aagatgcagt ccatgactaa ga 32

<210> 61 <211> 1740 <212> DNA <213> Homo sapiens <400> 61
aggttgctg acaaccgctc ttaactgctt catgctgaat tggggcatag taggggtcgt 60
gcagttgaga ttctcttggg aggggtgcoo tcaatgtcat caacattgga gcatgggcta 120
gcaggccagt ccagggtgccc gcggtagatc ttagtcatgg actgcatctg gggtccatt 180
tgaagaacca ttgtagttt tacagcttcg attctggaag agacaaacgt aacaaggagg 240
ttaaagatag aaggattgaa atgtacggcc tgaagtgcag gggcatatga gtgtggcg 300
tgcaagtggg gtttccctta gaaaaactcc gatacaatag ggcataata ttctaggaa 360
gccacattct ccatagaagc tctcggttaag gggagctact ggtagtacag cagcatcacg 420
ggggtgcagt gagagtgaag ggggtaaga gaacagtaaa aagaaaaata tgacaaggga 480
gggccaagag gatctacgat tctagtact ttccctcagg ttgtgcctg aagagcaggc 540
gcagatctc tagaggttca caggaatagc tagcattgtc tgctggattt tgggttcc 600
ttggcagtat ccagggttg gctcagtgat gacttatcca agactccact ccagccactt 660
tactcggtt agggtagata aatgactgg gtaggtcct tcccaggatg tgttaggga 720
tggggaatta aaggggaagg gacttgacta ataccatgtc accagggtgg aataattct 780
ttccctctc tcagggacag gttccctgta atgttttaag aactcgttga tatttgcta 840
tggaggtgat gtctgcaact aagtggccg tctctcagtc aagcacaagg tcattgggta 900
tgggaaggctg tccatacagc atctcatatg gactaagtc tgctttttgg ggacagttc 960
ggattcttag taaggctata ggcaacagag caggccatgc aaggtgggtt tcttgggta 1020
gcttttttag atgtcgttg agtgttcat tcattttctc aacttttctt gaggatcgtg 1080
gcctccaggc acagtgttag tgatattgta tacctaacgc ctgggatact cctgcgtta 1140
ctgcagcctt gaaattgggg ccattgtcac tctgtaaacc tcagggaagt ccgaatctgg 1200
gaattatttc atgaattagt acttttatta cctcttgggc cttttctgtc ctacaaggga 1260
aggcctccac ccaaccagtg aaagtaccca gattagtaga tactgaaatc tctgagattt 1320
gggcagtgtg gtaaaacta gttgtagtc ttctcctggg taatggcctg ttcttggttc 1380
tctgaagga gcttgccaat aaggcagggg attatttctt tggcacactt cacaggccct 1440
gactatctgc ttgacagttt tgaaggcc tggtccagta aataatgatt tggccatctg 1500
atgggtgctg tcaatgccta agtgaagggt ctggtgaagg gttttaagta atttccattg 1560
gttagctgca ggcaaaagta tttttctttt ggtggctggc catctgagg agaggaaact 1620

1680 1740
 >gaggttcccc attccatttc ttctgctgag tactggagct tggtttccca
 gagggggatta ccccatacta ggggtccttc tgtaagcatt tctaattggag agtctcgctc
 <210> 62 <211> 7140 <212> DNA <213> Homo sapiens <400> 62
 ttggtcttaa gaacacaaat gatatggctc caatgactgg aggaacacca gggtccttgg
 tctcacgctg atttagataa aacgactgtc aggcctctga gcccaagcta agccatcctc
 ccctgtgacc tgcacgtata catccagatg gctgaagta accaaagaat cacaaaagca
 gtgaaaatgg cctgttctct cottaactga tgacattcca ccattgtgat ttgttctctg
 cccatcttaa ctgagcgtatt aaccttctga aattccttct cctgggtcaa aacccctccc
 actgagcacc ttgtgacccc cgcctctgcc cctaagagaa aacccctctt gattataatt
 ttccactacc caccocaaat ctataaaaat gccccacccc tatctcctct cgctgactcc
 tttttcggac tcagcccgcc tgcacccagg tgaataaacc agccttcttg ctacacaaa
 gctgttcttg tggactctct tcacacggac gctcatgaca ttggtgcca aaacctggga
 tagggaggact ccttcaggag accagtcccc tgtccttgcc ctactctgt gaggacatcc
 acctacaacc ttgggtcctc agaccaacca gcccaaggaa cagctacca atttcaaact
 gggttaagcag tcttttctct ctcttctcca gctctcttg ctacccttca aactccctct
 ctactaccc ttcaatctcc ctgtccttcc aattccagtt ctttttctct tctagtagag
 caaaggaga cacattttat ccatggaccc aaaactccag caccagtcac ggacttggga
 agacagctctt cccttgggtg ttaatcactg cggggacgcc tgctgatta ttcaccaca
 ctccatttgt gtctgatcac ggtggggaca cctgcttgg tcaactcccc acattccctt
 ggtgttacgt caactgcaaa agcaggggac gctgcttgg gctgctcacc caccoccttc
 tctgtgtctc tacctttctc tttaaactta cctccttcac tatgggcaaa ctctgcct
 ccattccccc ttcttctccc ttagcctgtg ttcttataaa cctaaaaact cttaactca
 cactgacct aaacactaaa tgcttattt tcttctgcaa cactgcgttg ctgcagtaca
 aactgataa tagctttaa tgccagaat atggcacttt caatttctcc atcctacaag
 atctagataa ttttctgga aaaatggaaa aatggtctga gatgcctgac gtccaggcat
 tcttttacac attggtccct ccctagtctc tgctccaat gcgactcacc ccaaatcttt
 ctcttctctc tctgtctgt tccttcagtc tccaccccaa gctctgagtc ctttgaatcc
 tctttgcta cagaccatc tgaactctcc cctcctcccc aggctgctcc tcaccaggcc
 gagccaggto ccaattctc ctacgctct gctcccccac cctataatcc ttttatcacc
 tctctctcct aactcagtc cggcttacag ttctgtctg tgactagccc tccccatct
 gcccaacaat ttctcttaa agagggtgct ggagctaaa gcatagtcaa ggttaatgct

5'

5cttttttctt tatctgacct ctcccaaatc agttagcggt tacgctcttt ttcatcaaat	1740
ataaaaaacc agccagttca tggcccatct ggcaacaacc cttacagggt ttacagccct	1800
agacctgaa gggtcagaag gccgtcttat totcaatatg cattttatta cccaatccgc	1860
tcccaacatt aaataaagct ccaaaaatta aattctggcc ctcaaacccc acaacaggac	1920
ttaattaacc tcacttcaag gtgtacaaga atagagtaga ggcagccaag tagcaacgta	1980
tttgagttgc aattccttgc ctcaactctg agagaaaccc cagccacatc tccagcaaac	2040
aagaacttca aaacacctga actgcagcag ccaggcggtc ctccaggacc acctccccca	2100
ggatcttgc tcaagtgcg gaaatctgac cattggggcca aggaatgcct gcagccagg	2160
attctctcta agccacgtcc catttgtgca ggacccact ggaaatcgga ctgtccaact	2220
caccggcgag ccaatcccag agccctgga actctggccc aaggctctct gactgactcc	2280
ttcccgatc ttctcggtt agcagctgaa gactgacact gcccgatcac ttcagaagtc	2340
ccctggacca tcacggatac tgagcttcag gtaactctca cagtggaggc taagtccatc	2400
ccctgtttaa tcgatacagg ggctaccac tccacatcac ctctctttca agggcctggt	2460
ccctttccc ccataactgt tgtgggtatt gacggccaag ctccaaaacc ccttaaaact	2520
cccccactct ggtgccact tggacaacat tcttttatgc actcttttc agttatcctc	2580
ccctgcccag ttcccttatt aggcgagac attttaacca aattatctgc ttccccga	2640
cttctgggc tacagccaca tctccttgcc gcccttcttc ccaacccaaa gctccttca	2700
tatcttctc tcatatcccc ccaccttaac ccacaagtat gggacacctc tactccctcc	2760
ctggcaaccg atcacacgcc cattactatc ccattaaaac ctaatcacc ttacctgct	2820
aatgccagt atcccatacc acaacaggct ttaaagggat tgaagcctgt tatcacttgc	2880
ctgtacagc acgggctctt aaaaacctata aactctccat acaattcccc cattttacct	2940
gtctaaaaac cagataagtc ttacagggtta gttcagaatc tgcaccttat caaccaaatt	3000
gttttgcta tccacctgt agcaccacac tcgtacactc tttgtctc aatgccttc	3060
cccaacaact actattccgt tcttgatctt aaagatgctt ttttactat tccctgcac	3120
ccctcatccc agcctctctt tgcttttacc tggactgacc ctgacaccca tcagtcccag	3180
cagcttacct gggctgtact gccgcaaggc ttcagggaca gccctcatta cttcagccaa	3240
gctcttctc atgatttact ttcttccac ctctctgctt ctoaccttat tcaatatatt	3300
gatgacctc tactttgtag cccctcctt aaatcttctc aacaagacac cctcctgctc	3360
cttcaacatt tgttctccaa aggatatcgg gtatccccc ccaagctca aatttctct	3420
ccatctgtta catacctcgg cataattctt catgaaaaca catgtgctct cctgccaat	3480
tcgctctcca actgatctct caaatcccaa cctcttctac aaaacaacaa ctcttttccc	3540

Tcctagggcat	gggtggatac	ttttgccttt	ggatacctgg	ttttgccatc	ctaacaaaaa	3600
cattatataa	actcacaaaa	ggaacacctag	ctgaccccat	agattctaaa	tcctttcccc	3660
actcctcttt	ccattccttg	aagacagctt	tagagactgc	tcccacacta	gctctccctg	3720
tctcatccca	acccttttca	ttacacacag	cgaagtgc	gggctgtgca	gtcggaaatc	3780
ttacacaagg	acggggacca	tgccctgtag	cctttttgtc	caaacaactt	gaccttactg	3840
ttttaggctc	gccatcatgt	ctccatgcgg	tagcttccgc	tgccctaata	cttttagagg	3900
ccctcaaaat	cacaaactat	gctcaactca	ctctctacag	ctctcacaac	ttccaaaatc	3960
tattttcttt	ctcacacctg	acgcataata	ttctgtctcc	ccggctcctt	cagctgtatt	4020
cactctttgt	tgagtctccc	acaattacca	ttcttcctgg	cccagacttc	aatctggcct	4080
cccacattat	tctggatacc	acacctgacc	ctgatgattg	tatgtctctg	atctacactga	4140
cattcacccc	atttcccatc	atttccctct	ttctgttccc	tcagtgtgat	cacatttggt	4200
ctactgacgg	cagttccacc	aggcctgac	gccactcacc	agcaaaggca	ggctatgcta	4260
gagaatcttc	cacatccatc	attgaggcta	ctgctctgcc	cccctccact	acctctcagc	4320
agccgaact	gattgcctta	actcgggctt	tcactcttgc	aaagggacta	cagctcaata	4380
tttataactga	ctctaaatat	gccttcata	tcttgacca	ccatgctgtt	atatgggctg	4440
aaagagggtt	cctcactacg	caagggtcct	ccatcattaa	tgctcttcta	ataaaaactc	4500
ctctcaaggc	tgctttactt	ccaaaggaag	ctggagtcac	acactgcaag	ggccacccaa	4560
ggcgctcaga	tcccattact	ctaggaaatg	cttatgctga	taaggtagct	aaagaagcac	4620
ctagcgttcc	aactctctgc	cctcatggcc	agtttttctc	cttcccatca	gtcattccca	4680
ctactctccc	cattgaaact	tccgcctatc	aatctcttct	cacacaaggc	aatgtgttct	4740
tagaccaagg	aaaatatctc	cttccagcct	cacaggccca	ttctattctg	tcattcttcc	4800
ataacctctt	ccatgtaggt	tacaagccac	tagtccacct	cttagaacct	ctcatttctt	4860
tccatcgtgg	aaacatatcc	tcaaggaaat	cacttctcag	tgttccatct	gctattctac	4920
taccctctag	ggattgttca	ggccccctcc	cctccctaca	catcaagctc	ggggattttg	4980
ccctgcccag	gactggcaca	ttgactttac	tcacatgccc	tgagtcagga	aactaaaata	5040
cctcttggtc	tggttagaca	ctgtcactgg	atgggtagag	gcctttccca	cagggtctga	5100
gaaggccact	gcagtcattt	cttcccttct	gtcagacata	attccttggg	ttggccttcc	5160
cacctctata	cagtcacaata	acggagcagc	ctttattagt	caaatacact	gagcagtttt	5220
tcaggctctt	ggtattcagt	ggaacctctg	taccccttac	tgtctcaat	cttcaggaaa	5280
ggtagaatgg	actaatggct	ttttaaaaac	acaccccacc	aaactcagcc	tccaacttaa	5340
aaaggaggat	agagcccaaa	aactcgcaac	caagctagta	attatgctga	acccccttgg	5400

gcaactctcta attggatgtc ttaggtcctc ccaaatctta gtcctttaat atctgttttt 5460
 ctctctctct tattcgacc ttgtgtcttc cgtttagttt ttcaattcat acaaaaccgc 5520
 atccaggcca tccaacatcg ttctatacaa taaatgtccc tttaacaac cccacaatat 5580
 cgccctctac cacaaaatct tccttcagct taatctctcc cactctaggt tcccatgccc 5640
 cccataatcc ctctcgaaag agccctgaga aacatagccc attatctctc cataccaccc 5700
 ccaaaatttt tgctgcccc acaattcaac actattttac attattttcc ttattaatat 5760
 aagaagacag caatgtcagg cctctgagcc caagccatca tatcccctgt gacctgcaca 5820
 tatacatcca gatggctga agtaactgaa gaatcacaaa agaagtgaag atggcctgtt 5880
 cctgccttaa ccgatgacat tccaccactg tgatttgttc ctgccccacc ttaactgagc 5940
 aattaacctt gggaaattcc ttctcctggc tcaaaacctc cccactgag caccttgtga 6000
 cccctgcccc tccactaccc acccaaattc tataaaatgg cccaccccca tctcccttag 6060
 gactcctt ttttggactc agcccgctg caccagggtg aaataaacag ccttgttgtc 6120
 cacacaaagc ctgtttgggt gactctcttc acagggacgg gggtgacaa aacacggaca 6180
 gacatggagt ggttttaagg agcagagagt ttaatacgca aaaaagaagg aagaggctcc 6240
 ctgttacaga cacagagga gggggctcca agccgagaga aggaaccccc atgtgcagt 6300
 gaaaagtgg tgattatact gggaggctgg aggaggcgg gtctgatttg cacagggccc 6360
 gggggatttg gttgaccagg tgtatcattc atgtaccgg caaaaaacct ggccctccca 6420
 cctcagccct ttaatatgca aatgtgggt gccatgatgt tctgaaaaca catgaattat 6480
 gggaggggg ccatgacact tggatcatgt gctgacaaga agagggtggg aatcgccatg 6540
 ttggccatgt tgggtggacc tagtttttaa tagcctgcat ttgcatatca aagtttgctg 6600
 gcctggetct ttaagctgtc tttctgtta gaaaaggaat ggtttggaat gggtaggggt 6660
 tgcttcttat tacaagaaaa ttccaaaaa cctttactct ttctagctgc caaaaaacta 6720
 tttcttaata acttatgtat taccataatt aggcagcacc aaagatccct gcaggtcaga 6780
 cactgcaat taacatgctg gctttactgc tgattatgg agctgcatcc acctagcctc 6840
 tcataattga actgcctgac ctctgccacc ccacgagcca ctatcccca ctataaatca 6900
 gccatttcg attgtaacat ctgccactta ttcccgacgt tgtggtatat cctatagatg 6960
 aattcattca acatccattc caacaccacc tctcttgcc tctatactc tctggagagt 7020
 gaattactga gtcacatgat ctctactgca gtcatttgtg gctatgtgac atagttctgg 7080
 acagtgaaca tagacagaag tccctggggc gggcttcctt tctgggatga gggcaaaacg 7140

<210> 63 <211> 44100 <212> DNA <213> Homo sapiens <400> 63
 tgcctttatt tccgtaggct ggtcatatgg cgctagcact cacataaagc taccaggagg 60

Agcgaatgaa accaaaaatca ctttaccttc acagcacgag gccgtcgtcc ctctcgatat	120
ttggcccgtg tgtcgcatc cgccctctgg acgtggtgat caaataaaat ccctagctcc	180
ccgcgcgtcg acgcatctct gacctcttg atcctcgag ggaggacaa atccgcccta	240
ctgagctccc ttttatccaa taagagagcg ggatgagtta aggagtgcc ggattggctg	300
gagaatcgac agcgtcgcc atcgtttcct gcgtgcgaag atttgatgaa cgagggtccg	360
cccccgagcg gctcggcgga gaggcgcggt gggtgacaga agctttcttg tccccccac	420
tacaggctta cggcaggatg cgcagcgggg agagggggcg gggccgcagg gggcggggcc	480
gatcgatctc ctccggctcc gacgtctctg gcctgcggg tcccggtctc tttgcggcgc	540
tagggtgggc gaaccagag cagcgtccg ggacgatgtg gggcagcgat cgcctggcgg	600
gtgctggggg aggcggggcg gcagtactg tggccttcac caacgtctcg gactgcttc	660
tccacctgcc gcggcgtctc gtggcccagc tgcactctgt gcaggtaacc tgcggcccc	720
gagccacctg atcttcagcc tggggtcgga cgaggccgaa gcctctcagg gacgcggcgg	780
gacaccggct gccacccggg cgcgcggaa cgcgcagag atcagggtcc ctgcagcgca	840
gggcctctct gggtagtctc tggatccac aagtcagtg cagccctggg ctgctcttat	900
ccagggtctt ttcacttggt gaaactgaac ctagaacgt cctaatactc taccactgtt	960
cttataaata ttccttatcc caggtcgga aagctctga gaagtgggtt gttttatta	1020
ctttaaaagg tgttttctt gccagccatt tccagttaac ctgcgtctg gccgtccggg	1080
ccgcgagagc gggacgcaga gttgtggcg gagccctgt cggttcccg ggactaagca	1140
cgcgtccca tgagcgggaa aggttaatac aatgatggt ctgcctcgcg tcgtgacgc	1200
ggaacacagc tgtagtgtgt taggaacaca taacgtagtt aagatcact gaagctctgc	1260
gatcagtcgc cctctctgac gttgtggtta ggatgtttca cagttctaac cactggtgga	1320
gatacagcgt ccatattttc ataattaaaa atagaggcac atggtctcac gagtgtgagt	1380
gtacttatgg gggcaaaagg acgcggtatt tgaatcctc ataatcctg gatgcatggt	1440
accaccagtg gctaatcta tgcaatgaat agagtgtgca ataattcaa gcatcccttc	1500
tttccacttg agttacttcc ccatacctag gggaagatat ttttggtcca ctgaaacat	1560
gagttcagca gaatcctct atcatctcg ttattatatt taccactaa gtgacaaac	1620
ttttggtttt tgatgggctt tatggctaga gacaaatcag tcactgtcac caagtccag	1680
gtagaagttg gttcagtgct ctgtcagctt cgatgggatt tttcaacatg tttcaaact	1740
tgcaactaat agtaggaatg ctttcttaca gtaactctaa tttgatccta agatgtagtt	1800
gttaccttac attcatcact gtttaagaat ttagtggctc tgatctttgt tttaaatttt	1860
gagccttcgg gaagtactta taagaattaa ttcatgcata tctttttgaa atgtaaatgt	1920

Ctttagccct ggaacaaatt gctgtttctg ttcagcccat attagcagaa taggtcaact 1980
 ttactttcta attatcaatg taataagttt attactttat agattccata aatctatata 2040
 tttattcttc gatgaattat ataaattttat agaattttatg ttttatagaa aatttgga 2100
 gcatggaaaa ttattaacaa gaaaataagt taccataat cccagaactt agaggtgact 2160
 aatgttgaca gtttgatca aatcttccag tttgtttctt aatctttatt ttaacataa 2220
 atgaggctct gtatacacac gtacagtttt gtgtcctggt gtttttattt aatgttatta 2280
 tgagtgtttt attttgttaa aaggtcatca ttttaagttg ttaattagta ttctagcaca 2340
 aatttgocat aatttattta attgtttact atgattgacc atttagattg tacttaattt 2400
 ttaggcata gaagtataa actatatttt aatcagacgt tgaaaaaac acatctttgt 2460
 ttgaaaaaca tcatttttat tctggttgto taggatagat tcccagaatt ctggggttag 2520
 aggccataga taattatgaa agcagaaga ttacaagtt gggagttaat acttgaatta 2580
 Ctttatttgg ggtgaagcat tgagtgcata atacagatca tgcagtaatg ggaagaagg 2640
 ttggaacaat ggtttttctg cctatgtcag acttaccttg aagcttttaa gaatacagat 2700
 gttctgatca accctcagac ctattaaatc agacctaaaa tcttagggaa taggctttag 2760
 gcatctctaa ttttaaaaaa tttattcagg ctacttggat gcacaaaaga gttgagacct 2820
 atgtgtctag aatcatagaa ttttaatgac gatagagacc ttaagcatct aggtcgtttc 2880
 gtaatttta catgtaagga aactggcatt cctaggccag taccattgcc atgcagctaa 2940
 ttgtccctct tgtctatagc tcaactgca tcaccaacc taccgttctc actgtttctt 3000
 ttataaccaa tctctctccc acttctgttc tcttactcat gccattcttc cctcagtc 3060
 ttcttctctc tccatacaaa ttccatgtct ttaaaaagga ataactctac ctctccaca 3120
 tagctttcca attctctgtt gccacattt gtctcccttt caatacttct ctgttgtgtt 3180
 atgtgacaca tcacatttga tatactctgt actgtgtttc aagtattgta ttctctgtt 3240
 tactcaagtc attatttcag gactgactac ccagtagatg ctttaagta ggaatttcta 3300
 accttgccac tgttgacatt ttgagctgga taattttttg ttttggggg tctcctgtac 3360
 attttaagat gtttaacagc accttggcc tctatccagt agacgctgt actgcctccc 3420
 cctatctgtg acaacaaaaa aggtcttcag acattgtcag atgtctactg aaggacaaaa 3480
 tcacotctg ttgagaacca ccgcttcaac taagtattct tctctgtact cagaacttga 3540
 tgtgattgca gcagggggag aggattcata tacacagtga atgcaaacga acctaatca 3600
 ccattcgat atggccacac aattttcatt tcccttgtgt tagcaagaga taccctaggc 3660
 tttggaactg attattccta aggcattctg atgtatggtt ttacctgcag atttctgtgt 3720
 aatactgata cctcagttt ggtcaaaaga ggtaaatga ttgattgatt tgatttgact 3780

Cctggaaaag acgctccttt ctgctgtctt ctttctcttc ttacctgaa tagccagggc 3840
 tctgtggttc aagtgaagta ttttgacata aaaattaact tagaacattg gctgcagag 3900
 tttgtcaat ataactgagc acatattgtg gctttatgga gctgggtact actttttgac 3960
 caaataaata attagaagta ttttctctcc tcaataaggt tcatttttcc ttttttcagt 4020
 gagctggtag agtttccctt tttgatattt cagggcactt ttcataattc catctcttaa 4080
 gtttctcat atgaagtaga atttatctgg attatgtatt gctgactctg atgaaaaccc 4140
 atagaaagca tctggggcct gatcaccttc attcttgtaa tagctcacac ggttacagct 4200
 gatatggtaa ctttaagact ttgattccaa atctaggcaa aatacactca gttgaaagaa 4260
 tttgtcagcc agaacagttg gactgttctg tgaaaattgt gagaaaaatt acacaactaa 4320
 gtgatacatg atgatggcct tcttaaatat aaaattgtaa taacatgggt aatttccagt 4380
 acgttatatt gtcccagaag tggctccaac attgtttgaa atttgtctca tttaaagaaa 4440
 gataagctgg ctatgggtgc tcacgcctgt aatcccagca ctttgggagg ctgaggcagg 4500
 gagatocact gaggtcagga gttcgagacc agcctggcca acatggtaaa accccatctc 4560
 tactaaaaat acaaaaatta gccgggcatt tgggtggggc ctgtaatccc agctacttgg 4620
 gaggtctgag caggagaatt gcttgaatct gggaggtgga ggttgcagtg agccgagatt 4680
 gtgccactgc cctccagcct gggtagaca gtgagtctcc gtctcaagaa aaaaaaaaaa 4740
 taaagcaaga aacataaaga ctgggcattg tggctcatgc ctgtaatccc agcactttga 4800
 gagactgagg tgggaagatc acttgagccc aggaggttaa ggctgcagtg agccgtgatt 4860
 ttgccactgt actcgagcct gggcaacaca gtgagatcct gtctcaggaa aaaaaaatt 4920
 gcatgtaaat gaatgaattt gatatttaatt attttaaatt atgaaaactg tctgtgtag 4980
 atgtagatct tgccatgttg cccaggctgg ctttgaaact ctgggctcaa acaatcctcc 5040
 tgtctcagtc tcccaaagta taaagattac acatgtgagc cactgcacct ggctaatat 5100
 ttttaactta atgaatttat tttgatataa ataaattaat aacactgaag ctctcgtata 5160
 taataagtct ttttgtgtgt gtgacgggtt ctcaactctg tggccagact ggagtgtaat 5220
 ggcactatca tggctcactg tagcctcaac ctccctgact caagtgatcc tcccactctg 5280
 gcttctgag tagatgggac cacaggcgta tgccaccaca cctggctgat ttttaaaatt 5340
 tattattgat acatattaat aaaattattt ttatttttaa aatgatatat gtggctgggc 5400
 atggtggctc atgacctgaa tcccgacagt ttgggaggcc gaggtgggag gatcacttga 5460
 gaccaggagc ttaagaccag cctaagcaac atagttagat cccatctcta tagaaaaaaa 5520
 aaatggctag gtgtgggtgt gtatgcctat attccagct actcaggaga ctgaggtgag 5580
 aggattgcta gagcccagga gtttcaagtt acagtgcact atgattgtgc cagtgcactc 5640

Cagcctgggc aacagagcaa aatcctgtct caaaaaaaaa aaaagttcga aaatgcttat 5700
 gatgcaatat aagtagtgga aaaggatatt aaattgtgcc tatatgaaca caactatatg 5760
 aaaaacttgc acatagagaa aaggattaac aagaaataga ccaaattgtt cacatgggtg 5820
 tcttgtttgt ggagagaata tcagtagtgc attgtttcc ttccaagttt atatgttttc 5880
 cgaggctctt ataagtagtt tgtaattgtt taatcataga aaacctttt ttggtccttg 5940
 gccacaaact tacatgtttt aatgtaattg cttttttaat gagaataaat gttatatatt 6000
 gcttttttaa aacctatatt cccatagtta tatgagccct tacaattatt aagaggctgc 6060
 ataataaac gtttctggaa gggtagagaa gaaacagcag taattacctc tgagaacaga 6120
 gacatggctt cacattttac ccttttgtac gttttgtgct ttgtccacat gcatttatta 6180
 ttcttccaat aaataagtaa ataaatatgg attgtatact ccatctggtt ggtgtttcat 6240
 aattctaaaa ttatattgct acatttttaa agatgatatg tgtttctact tattaacgta 6300
 tatgttaaaa tagtaaatat atactttatt taataatttc cctattgata gacatttaag 6360
 tagtctcaa gtgttcacta tcatagaaaa tactgcacag atagcttttg ctatagtttc 6420
 ttttttctt gaactcgtaa ttgggaataa atgctcaaat agttatatg ggctcaactg 6480
 ttatttaagt ttattgactg actgctgcca ttttgaatto tgaagggtt gattaaattt 6540
 ttaatgctgc cataagaata taagggtatt ggcttcatta gcattccacca gcattgggtg 6600
 ttggaaatga ttatagattt ttaaatgcta caacaaatgt agataacaga gaactatcta 6660
 tgaactctt tttagcatg tgaattgtaa taatagtta ttttcatgtg aatccagaaa 6720
 tatgtatacg aaaacctttt ttctctctat ttcttatatg aatagaatca agctatagaa 6780
 ttgggtctgga gtcaccagcc tgcattcttg agctgggtgg aaggcaggca ttttagtgat 6840
 gggggacagg taagcacatg tgatggcaat aactttcttc taatatcaca taatatagca 6900
 atagaataa aattaaagt ttatgtttt tgttaaagga ggtgagatg cacctaattt 6960
 gtatgctatt atgtaactag tctaggatat tgaagctgac tatactctgt ttttagtgca 7020
 ttatcttgta gtttaccata ctccctactt gcttcttatt ctactattta actcattttc 7080
 cacatccctt aattttggtt toatgaaatt attttctct ctgaattact aggttctact 7140
 tactattatt aaactttatt totgacatat ttataacct tccatggtct cacttgatta 7200
 aaaaataaaa attcagctgg gtgcgggtggc tcacacctat aatcccagca cttggggagg 7260
 ccaagggtgg cggaataatt gaggtcagga gttggagacc agcctgccca acgtggtgaa 7320
 accccccctc tctaactaaa attcaaaaat tagctgggca tgggtggcag tgccgtgaat 7380
 cccagctact caggaggctg aggcaggaga attgcttgaa cctggggagt ggagggtgca 7440
 gtgagctgag attgcactgc tgcacttcag ctgggtgaca agagcgaaa aatgtcttga 7500

aaaaaataa aaaataaaaa attctacaac acagggttat tattttttcca tttttgtttt 7560
 cccttatgag ttttaatatgt ttagattata aacctgaaag cttgaatacc tatgtctatc 7620
 tttgtttttc ttatgtttat caagttatct ctttaaacat tttctaaact gtaagaataa 7680
 tgtgaggctg ggctcaatgg cttatgcctg taatcccagt gctttgggag gccaaaggtg 7740
 gaggaccact tgaggccacg agttcaagat tagcctggct agggcaacata gcaagaccct 7800
 atctctataa aaaaatttaa aaaattagct gggcatggta gcaaatgctt gtatgccag 7860
 ctactcagca gactgaggtg ggaggaatgc ttgagaccag gaatttgagt gacctatgat 7920
 tatgcactcc agcccgggca atagcaagac cctatctctt aaaagaagaa gatgtagtaa 7980
 taatacatat tcattataac tattttacca ttgaaagtaa aaatgagtt tttacctttt 8040
 cccagtccca tcctcagaat ggggatctca gttagacctt aggattgaa gaatgagatc 8100
 attcatattt tctgcaatta ttacccaca aaatatttca gataaccttc catgtattac 8160
 aaacaatgtg catttaacat gtctctctct tctctctctc ctctgtgtgc gtcttcatga 8220
 tctctgttg cagccctgcc agtaagacac tatctctga agaactcact ataggaacag 8280
 gaagtggact ggctaggcca ggagtcctta gcttcttagg gggcaggagc tgctttgtgc 8340
 ttcttcagaa tcagatatat atgtggactg aaacatttaa aaacagaata gccaaagggtg 8400
 ctatacgttt aaaacttata tagatggggc tacattgtct tctattacta atttcccatg 8460
 gcaatacacg agagtgccat gtctttttaa cttgttttga gcacagacta atcttgttta 8520
 tgcattgttt ttgatgagaa taggtactc atgagaaatc tgtaaaccta acactagtcc 8580
 cttgcatact ctaaattgtt gctagaatct taaaatttta gcaccagacg gaccttagaa 8640
 atcatttaact ttggtgcttt gttctacaat acaaggagat ggaatatatt acccaggatt 8700
 gcttagcagc ttacagttct gccctctgag taccagcac ttcctctgtg gcaacatcaa 8760
 cttctgatt ttcaagtctt aattagtact ctgaagaatc ctacttgttt ttaactccca 8820
 tttgctttga agtgacttta cctgattttt ttagatccct tattgcagca atgccactaa 8880
 gaaactgagt ctctagcttc ttggtgggca ggagctgctt tgtgcttgct cagaatcatc 8940
 cttttcagta agggagatat tgaagagaaa tctactgagg agtctggggg tgaggcactc 9000
 agggaaatcc tgcctcagtc caaaaagca gagaggaagg gttggttacc tagagtattt 9060
 aacatgcaga ggctttggat ttactcctt taatccttgg aaatgcctat ggaaggggaa 9120
 aggaagtaag atggtgactc cagcttatag acatactagt gttacatata tttaaactat 9180
 aataggaggg tattattagt ttacttaac ttcaactgt gaaggattat acttctcaat 9240
 atttgtctcc agtgtctatt tcagtgattt ttctactttt cttgaagcag catgtctgtt 9300
 gcaaaacttc tagaataat gagaatatat atatattaga tcaagccata acttgatgat 9360

atagtcattt cttcttatat tttttactta cattttttaca ttttaaatgat tacttttcatt 9420
 tttgaaaaac atgctcatgct gagatgtatt tttcttcatt ctgtaattag ttatgaaaca 9480
 gtttttccta aaatgctgag tatatcaagt cttggctaag aataagtaat aaatatgtgc 9540
 cacatgaaag actacacata tagccagggtg cagtggcttg cacctgtttt cccagctacc 9600
 caggaggctg aggcaggagg attgcttgag cccagggttt ccaggctgca gtgaactatg 9660
 attgtaccac tctactccag aatgggtgac agagccaggc cccatctctc aaaacagaaa 9720
 agaaaagatta catagactac atatacaccc ccatccaaaa catcacaca catctactta 9780
 acctaaaaatg gtaagaagat aacttcttat tttctaata atgacacaga aaagtttttt 9840
 taaagttagt ttaaatTTTT aattttttct aggtatttct caagccatgt tccatgtgg 9900
 tatctgtgca acaagttgag gtggaacccc tctcagcaga tgattgggag atactggtaa 9960
 agaaaaccaa ataagaacta tctcatttaa ggtaaaatta cttcacata tcaatgtctt 10020
 tagctttctc taagctttat tatataattc gagttgggtt tgaattataa gaatgaattg 10080
 gggccaggca cagtagctca tgcctatagt cccagcaact tgggaggcca aggcagggtg 10140
 attgcttgag tccaggagt caagaccagg ctgggcaaca tgggtgaaac ccgtatctac 10200
 taaaaatata aaaattagcc aggcattgga gtgcatgcca ttagtcccag tcaactggga 10260
 ggtgaggca ggagaatgc ttgagccgt aaagtcaagg ctgcagttag tcaggatctt 10320
 gtcattgtac tccagctctg aaaacagagt gagaccttgt ctcaataaaa aaaagaatga 10380
 attgatagag atctaagtga caacctgaca actataggta ataaaattgt attggggatt 10440
 catgttaaat gagtagattt taactactct taccacaaaa acacaaaagt gggttaactgt 10500
 gagatgatgt atatgttaat ttacttcat atagtaacca ttatactatc tatatgtagc 10560
 tcataacacc atgtcgtgta tattaatat gcacattaaa atttgtttt taaaaaaga 10620
 attgagattt tttttaacta gatatggagt ggacaaaatg taaagtgaat tgatcttttc 10680
 gtctgttgggt tctaggagct gcatgctgtt tccctggaac aacatctctt agatcaaatt 10740
 cgaatagttt ttccaaaagc catttttctt gtttgggtg atcaacaaac gtacatattt 10800
 atccaaaatg ttaggtgcta ttgtaatat tgctgtcata ttctacata tagcattgag 10860
 tccaaagtag aaatgaatgt gcactaatga gctttatttt ctacacagt gcaactaac 10920
 cagctgctc ttatggaagg ctggaaactg acacaaaact ccttattcag ccaaagacac 10980
 gccgagccaa agagaatata ttttcaaaag ctgatgctga atataaaaaa cttcatagtt 11040
 atggaagaga ccagaaaagg atgatgaaag aacttcaaac caagcaact cagtcaaata 11100
 ctgtgggaat cactgaatct aatgaaaacg agtcagagat tccagtgac tcatcatcag 11160
 tagcaagttt atggactatg ataggaagca ttttttcctt tcaatctgag aagaacaag 11220










agacatcttg ggggttaact gaaatcaatg cattcaaaaa tatgcagtc aaggttgctc 11280
 ctctagacaa tattttcaga gtatgcaaat ctcaacctcc tagtatatat aacgcgtcag 11340
 caacctctgt ttttcataaa cactgtgcca ttcattgtatt tccatgggag caggaatat 11400
 ttgatgtaga gccagcttt actgtgacat atggaaagct agttaagcta ctttctccaa 11460
 agcaacagca aagtaaaaca aaacaaaatg tgttatcacc tgaaaaagag aagcagatgt 11520
 cagagccact agatcaaaaa aaaattaggt cagatcataa tgaagaagat gagaaggcct 11580
 gtgtgtctaca agtagctctg aatggacttg aagaattgaa caatgccatc aaatatacca 11640
 aaaatgtaga agttctccat cttgggaaag tctgggttag tataaaatctt ataacttggg 11700
 agaaaattta tgtggcttaa acatccccaa attatgaatt agaattagat ttcatatata 11760
 aattgaaat caattaaaaa gaaacacagt gcctaaaggc acttggggga cacatttacg 11820
 ctttcagta aagtccttgt ttggataaag attgtatgtt tcttggccaa gtaagcttga 11880
 atagggtacaa gcttagatag gttcaggcca gagaggtcaa aattacttgc ctgagattgc 11940
 atagctagtgt ttacaactag gattcaaac caggcagatt gacttggggg ttcactcagga 12000
 ttggagtggc tacaagacct cccatcttta atgcttgacg atttgttccc cagttaccga 12060
 atgcaacttg ttaatatag ggaaggggc cagtgtaggg agagatccat ggcatgaggt 12120
 aaccttctg ctgcatgtgg tggcacctgg attggaatgc atccaggagc tgcctaccct 12180
 atcggtgtct gctctttaat ttgtgtataa cggagaggaa gtacacaggc caactagtgc 12240
 ccagccct catcctggcc acaaatatta atgctacct tatatgacat aagtactag 12300
 tccatttatt ggaacctaaa tttgaaccac tgtaaagtaa gacttcatag tgataaagag 12360
 atggaacttgt taggaaagag aataaaatag aaagagaagg ttgtctcctt ttgtagattt 12420
 ttttttttc tccaacagtt ttacctgtga cctttataca aataactgac aaagcattaa 12480
 tctcttggc ctacatcatt ttcttttcta ttttttttt ccacaagatg gagtttact 12540
 cttcttggc aagctggagt gcagtgcat gatctggctc actgcaacct ccgcctccca 12600
 cgttcaagtg gttctctgc ctacgctcc tgagtagctg ggactacagg catgcaccac 12660
 cagcctggc taattttttg tttttttagt agaaactggg tttcaccatg tttagccagc 12720
 tggctgga ctctgacct caggtgatct gcctgcctcg gctcccaaa gtgctgggat 12780
 tacaggcatg agccaactgt cctggcggc ctacatcatt ttctaaagct ccagaccatt 12840
 cttttctttt cttttctttt cttttctttt cttttctttt cttttctttt cttttctttt 12900
 ttctcttctc ttctcttctc ttctcttctc ttctcttctc ttttctttc tttttttgag 12960
 ttagaagctt gctttgtgc ccaggctgga gtgcagtggc accacctcca ctactacaa 13020
 cctccacctc ccaggttcaa atgattctcc tgccctcagc ttcagagtag ctgggactac 13080

5' agtgtgctgc caccactcct ggctaatttt tgtattttta gtagggacga ggtttcacca 13140
 tgttggtccag gctagctctt aactcctggt ctcaagtgat ccgctgcct cagctctcca 13200
 aggtgctggg attacaggcg tgagccactg tgcttgccct cagatcatta ttttctgtta 13260
 gctttaaact gtccgttcag gagatccac tgcactctca aattcaaaat atctaact 13320
 gagcttatga tttagctggt tctgtcatta gatgggaata tctttttatt tcttgaaat 13380
 tatatggtga gaacaggggg aagtgtgat ggtaaagtcc tgtgattaag atagcaataa 13440
 ggactccgcc ctctccactc cactgaaggt tgaagagcca tggacaatga gaagtccacg 13500
 taggtgaaat caggtactaa aatggacttg gcttgagaga tcaaaattga tcaactggtg 13560
 atacaactaa caaattcatg ttaacttgaa cctttattac cctgtgaagc atggtgatta 13620
 aaaaaaaca acaacaaca aggaaacttg attgttaaat tctctttaag tcagaatatg 13680
 taccttagag tttttattta tgcttttctc taccattaat atgtctgcac ctgctcttta 13740
 gaagttaata gagagtaaa tctgtcttat gtctttcagt gcttacttat atttggaag 13800
 ttgagaaaaa tttttaacat cattattgat atatatatat atatatatat atatatatat 13860
 atatatatat atatatatat atagataatt tttttttttt tcttgagacg gagtctcact 13920
 ctgtcgccca ggcgggagtg tgggtggcgt ctccactcaa tgcaagctct gcctccacgg 13980
 tccaagcgt tctcttgctc cagctctccg agtagctagg atacaggctc ccaccaccac 14040
 gcttggtctaa tttttgtagt ttttagtagg acgaggttcc accatattgg ccacgctggt 14100
 ctcaaaactc tgaccttggt atccgcccac ctccgctctc caaagtgtcg ggattacagg 14160
 ggtgagccac tgogcccgcc tgaggtaaaa tttaaagtgt acaattcagt catttttagt 14220
 atatttatac tagttgtaca gccatcacca caatctaagt ttagaacatt ttcattaggg 14280
 ggtggggaaa attttactct gctttttaga ttaagtttct gtctggatct aatcatttaa 14340
 tcagacaatc aggcagattg tctgtgatta gttttggcca ttccagcttc ttcattggtt 14400
 gttaaacttc acaataaaag gctgctcaaa gattagaaat aacatttaat ttgaatgtaa 14460
 atgtgccata gtttaaaaga tgggttttgt gaatacagtc aaatacatac atttaaagct 14520
 ctaattctga agattatgta aagaaaagga aagaaatgta gggagaggat tgaatgttc 14580
 atggtataac aatatctgaa catccatctg gtcacaccgt tggattttga atgttttctc 14640
 ctctcfaat tcatatgtcg aaatcccaac tcccaagggt atcgatttag gagggtggtg 14700
 ctttggaag tgattaggct atgaaggatg agccttcctg aatgggattc gtgctcttat 14760
 aaaagagaac tgtgagaaat aagtttctgt cgtttgttag ccaccagtt taggatattt 14820
 tgatatagca gctgcgatgg actgagacaa ctatgagtta ttatgatagc ttctgttatt 14880
 tcacctaatt tcatagaagc taatatatca atatttatgc tatgaaatat ttcttaacca 14940

agctttgaat atatttatat tttgtttat ttttaaat ttagattccag atgacctgag 15000
 gaagagacta aatatagaaa tgcattgccg agtcaggata actccagggt aagttacccc 15060
 taaaaattcca agatctctaa agttacaacc tagagagaat ttagtgagtt caaatatata 15120
 tgttacatca aaattctttt acacgttttg taagatttct agttgcttta gctaagtaat 15180
 aagaatgttg tattctttt tgatacaaat ctttttttat tgtgttaaac tatatataac 15240
 ataaaaatg ccatgttcgc catttttaag tgtataattc aaaggcatta attacattca 15300
 taatatgtga caaccatcac cactatctat atccagaact ttcccatcac cccaaagaga 15360
 aacttggtac ccattaaaca ataattcccc gtccactcct tccccagtc cctggtaac 15420
 tctaattgat attgtgtctc tatgaattta cttattctag atatttcata tataagtata 15480
 agtatgcatt tgtcttatgt atctgaacta ttccatttaa cataatgttt tcaaggctca 15540
 tctgtgttgt atgtatcaga atgtatttcc ttttcatggc tgaatactat tccattgact 15600
 gcatatacca catttgttta tccattcacc tgttgatgga cacttgggtt gttccacat 15660
 ttttggctgc tgtgaataat gctacagtga acattgggtt acaagtatct gtttgagttc 15720
 ctcttttcag ctcccttggg atatacctag gaattatgtt taactttttg agaagctgag 15780
 aaatctttaa taaatgataa cacaataact tatatttgcc aatgcaata tgaatatttt 15840
 tggcttttaa gagattgac attttgccac gtggtgttaa ttaaaaaaaa ttgtcccatg 15900
 tggtttcagt attaatattg tagcctaaaa gagtgtctaga ctgttttact ttttactcag 15960
 ttaattcttt ggatactggt agagtcagga aatgagatat tgaacttaa gatctttgca 16020
 tgggggtcc agtggtccac acctgtaac ctgacacttt ggggaagctga ggtgggagga 16080
 ttgcttgagg ccaagagttt gagaatagcc tgggcaacat agcaagaccc catctctaca 16140
 aaaaaattaa aaaaaaaatt aagccaggcg tggtagctca cgcctgttat cccaacactt 16200
 cgggaggctg agatgggtg atcacttgag gtcaggagtt ggagaccagc ctggccaaca 16260
 tggtgaaacc ccatctctac taaaaatacc aaaattatcg gggcgtggtg ctaactctgt 16320
 aatctcagct actcaggagg ctgaggcagg agaaccactt gaactgagga ggtggaagtt 16380
 gcagtgagcc tagatctcac cactgcactc cagcctgggt aacagagcga gactctattt 16440
 caaaaaaagt aaaaataaaa attagacaca tgtggtggca catgctgtga gtctagcta 16500
 ctcaggaggc tgactgaagt gggaggatct cttgagccca ggagttccac actgcagtga 16560
 gctatgattg tgccactgca ctccagccta ggcaatatct caaaaaaat ttttttaaat 16620
 agattattag gccagacgtg gtggtcatg ccagtaatcc cagcactttg gaaggccaag 16680
 gcaggcggat cactgaggc caggagttt agaccagcct ggccaacatg gtgaaacccc 16740
 atgtctacca aaaatacaaa aattagctgc aatgtctata atcccagcta ctgggagccc 16800

Tgaggcaagc gaatcgcttg aaccgggag gcagaggttg cagtgagtgg agactgcgcc 16860
 actgcactcc agcctgggag atacagcgag attctgtctc aaagaaaaag gaatttgttt 16920
 tctgtcttt atcgtagagg gaggaaggagg agaattgggt tggaatgggt attgagttag 16980
 ccacattatg tagatgtat cactgggcat agagaaaagg agcatttaa acttttccgc 17040
 ctaacagatg tttcttcagg ctacactgca ctcatgtgc taactgtaat gtcaaatccc 17100
 agacctgtgc ctatagaaca tgaacatcct tcattggatt tgtttgggtca ggcttacct 17160
 ttattaggaa gatcagatgt taaaataagg gtgttaaagt taagttcaga tatgaggata 17220
 attcattact attccttttt ctggcagcct aaagacataa gtgaagaaga cataaaaact 17280
 gtattttatt catggctaca gcagtctact accaccatgc ttcttttgggt aatatcagag 17340
 gaagaattta ttaagctgga aactaaagat ggtgagtaca tttgttattt tgaacttttt 17400
 ttctatttaa atagtgtgac atttttaatt gttcttgcaa cctgtcatcac ctgtgaacag 17460
 tatgtgaata gtgaaatata attatgataa ttaaacagta gtttttatgt attgaaaaat 17520
 attctttggc ggggtgcagt gctcatgcct gtaatcccag cactttggga ggccgaggca 17580
 ggcggatcac ttgaggccag gagttcgaga gcagcctgcc aacatggcgc aacctatct 17640
 atacaaaaaa atacaaaaat tagcctgaca tagtggtgta tgctgtagt ccagctact 17700
 ggggaggctg aggcagaagg atcaactgag ccagaggagt ctgtgttctt gccactgcac 17760
 gcagcctgg gcagcagagt gagaccctgt tggggggaaa aaaaaaaaag tctttaactt 17820
 aataaaattt gacattttaa atcttaaatt atttcatctc tgtttcagta ctaactctgc 17880
 atttattact ttctttttta taggactgaa ggaattttct ctgagttagt ttcattcttg 17940
 gaaaaaagaa aaagataaaa atatttttct gttgagtccc aatttgctgc agaagactac 18000
 aatacaagta atagcatgtt attgaatatt taataaaata ctatttgtta catatgattg 18060
 ataataaagt atgaagtctc ttgtaacacc ttgcattgtg aagtgtatta aaaacctgct 18120
 aagagtaagg aataacttga tttaaaatat tttattctgt aatctcttta aattatctgt 18180
 acaaattatt gacttaacct aaatttaaaa atgaatgcct tagcacaatt aagtccaag 18240
 aatagagttg atcatgttaa ctggtaaatg gatcatgatt taaaattctt ctaggattga 18300
 aacaaatgaa aacgtagttt taagggtttg attttttaa ttctatttt tacatgcaat 18360
 tttactgcac aaccatctt attttgacag ttcttaaatt cgcaactctt cagaaatatt 18420
 atcagatcac ttttctttgc ttccataagt ttttttatta ttatattatt attttttttt 18480
 tttaaaagac ggtgtctcac ttgtctgcc aggcctggagt gcagtggcat gatcatggct 18540
 cactgcagcc tcgacctccc aggcctcaggt gattctccca cctcagcctc ccaagtagct 18600
 gggaccacag gcgaatgcc tgaatgcctg ctaatttttg tatgttttg agagataggg 18660

tttcaccatg	ttgcccgaa	ttgtcttgaa	ctctctgggt	caagcagttg	ttctgccttg	18720
cccacccaaa	gttggtggat	tacaagtgtg	agccactcgg	cccagctatt	ctagaagtat	18780
tttaagagtc	atcttttttt	tttttttgag	atggagctct	actctgtcac	ccaggctgga	18840
gtgcagtggc	acactctcgg	ctcactgcaa	cctccacctc	ctgggttcaa	gtgattctcc	18900
tgccctcagct	tcctctagtag	ctaggattac	aggcgcatgc	caccatgccc	tgctattttt	18960
tgtagtttta	gtagagacga	gatttcacca	tgttggccag	gctgctcttg	aactcctgac	19020
ctcaagtgat	ctgcccctct	cagcctccca	aagtgcctgg	attctaagtg	taaaccacca	19080
caccocagcca	agagtgtgtct	ttttacaata	ttattttttg	attagacat	tcattcttgt	19140
cataaaattg	aagatactct	agtcatttag	aatttcattg	tttggaact	agacattgtt	19200
tctttatttt	tgaaatgtta	ttgaaggaat	accatttgga	gaagatacaa	atgtaagaat	19260
tgtgaaaagg	ataattgtga	cacaaatcaa	aattatagat	aaaaatatac	ctgtaaaaatg	19320
gtttaaggca	ataacattct	ttctgcttgt	tgaccataaa	tatttatatt	ccctggatgg	19380
gtacattggt	attgtcaagg	gtgtttaa	aatgatcttg	catgcataat	ttattctctc	19440
tggtataaca	gaatcagcaa	tttagttttc	tgggacccga	gaaaaacatg	caaaagacat	19500
aatttgaaat	gtaaaaactga	tttttccttg	caactgtagg	tcctctctaga	tcctatggta	19560
taagaagaaa	acagtggagga	aattgacttt	attcttctct	ttttaagcgt	gagctctttg	19620
gggttaagaag	ttatggccaa	actagcatgt	tagacatgtt	tttaacacta	tatctggcag	19680
agttttcaat	gtaaaatatta	aagttagatgt	taatgtcaat	aagtgatctt	aataatgcat	19740
cagttagatat	tttttcaagg	attgtctctc	tcttcacgcc	tagcttataa	tttgcccttgt	19800
ctgtcttttt	tttttctctt	tatttttatg	tttttatcca	tcctcggtgg	taggggataa	19860
cctgtctctc	ttcgataaca	agaagtctga	agcttattag	aaattttact	ttgagaattg	19920
atcgatgaga	agaaagcaac	tagatatcac	gtggatcata	tatgcttgaa	taaaacaata	19980
attcttagaa	caaataaata	catttttaaa	gttaaagcca	aaaacattag	ttgaatgttt	20040
aaaaatat	caaattaagt	tattccttca	ctgtcttgta	ttactgtaat	aatttggatt	20100
atttgtgttt	ttctcaactt	ttaaaacaaa	tttttaaaaa	attcctcttt	tgattaagta	20160
gggctagata	aaatacaaaa	aatttttttt	aaactcctct	taatttccat	atttcttata	20220
taatgatgaga	atctcttata	aacactacct	cttagaagtc	tccacagaag	ctttggtaga	20280
tgtagtagta	gggattttgat	ttcttagaat	ggtataatct	gtaaatgttt	tagtaaaagg	20340
attaaacgat	aaagtcaaaa	tgtttatagc	acagtgttta	ttaatataaa	ataaaatctc	20400
tttttttttt	tttgagatgg	actctcaact	tgctactcag	gctggagatgc	agtgttgcaa	20460
ctcagctca	ttgcaacctc	cgcctcctgg	gttcaagcaa	tccttccgca	tcagcctcct	20520

3' agtagctgg gattacaagc atgcaccacc acacctgcct aattttttgt atttttagta 20580
 gagatggggg ttccaccatgt tggccaggct ggtctcaagt gatccgctgc cctcagcctc 20640
 ccaaaagtgc gggattacag gcgtgaacca ctgtgccag cataaagtaa aatctcttca 20700
 gactctcatg tgatcatgta aagtggcagg cagtcacagt caagaagtag tttaaagttc 20760
 atgtttgtaa aatataatct acagattgat actggatttc ataggtaatg tttaagagaa 20820
 aataagtttt tagttatcct cagtacttca aaagcaccga tttatgatta tgttgattac 20880
 taaactaaat catttggggg ctagagggtg ttttttatgt gttaaagattc cttaaggagt 20940
 tctattaggg caaaactttt agtaactgca tatttttaaa gtaataaaac taatttttaa 21000
 agcttgaggg ctgggcgcgg tggctcacac ctgtaattcc agcactttgg gaggccaagg 21060
 cgggtggatc acttgaggto aggagtttga gacgagcctg agcaacatgg tgaaaccttg 21120
 tctctactaa aaatacagaa attagccagg tgtggtgggt ggcaacctgta atcccagcta 21180
 cgggaggc taaggcagga gaattgctcg aacttgggag gcagagggtg cagtgagccg 21240
 gatcatgcc actgcactcc agcctgggtg acagagcaag actccgtctc aaaaaaaaaa 21300
 aaaaaaaaaa gcttgaagtc agattcgaca ttaatcagta tactttctct caagtagggg 21360
 caatttcta agatttttag ctttttaaat ttattaacta gtctgagcat ggtggcttgt 21420
 tctataatc ccagcacttt gtggggccga ggcagatgga tcacttgagc ccaggagtgt 21480
 gtagctagc tgggcaacat ggcaaaaccc cgtctctaca acaaatgac acacaaaaaa 21540
 ccaatcagc tgggtgttgt gttacactcc tgaagtcca gctactcggg aggctgaggc 21600
 aggaggatca cctttgccag ggcgttttag gctgcaggga gctgggttca caccactgcg 21660
 tccagcctg gatgacacag caagcccttt tctcaaaaaa aaaaagataa aaaattaaat 21720
 taaatttaatt aactacactg ggaaggcaaa attcagcatt tttttatagc taaattttat 21780
 cctgcttcag tcttttatca tgtaactatg tatatttttt acagaggagt gaattcctta 21840
 ggcgtatcct ccttgaggca catcactcac agcctcctgg gacgcctttt gtctcggcag 21900
 ctgatgtctc ttgttcgagg acttaggaat ggagctcttt tactcacagg aggaaaggtg 21960
 agtgggttaag gtgtgttcat tttctgttaa catttaataa cttttcattt atctttcttt 22020
 ggggttttgac catctattat atagggtggg ttttgaccat ctattatata gggttttatc 22080
 gacatatgga aagcattcat ttattcacta atattctgtg gtgtctgctt ttagggtgtg 22140
 ggggagtgat gacgaataag actgatgttc tccatgcctt ttttctgtgt cagttgatac 22200
 aattatatgg tttttctttt ttaggctatt aggtgttgat aggggtgagt aacttacaaa 22260
 tgttgaacca gccttgata cctgtgataa ataccacgta gttgtgtgtg atcattcttt 22320
 ctacattgct gagttttatc tgctaattgt ctgttgagct tttgtccatt taagtttgaa 22380

ägtgattagt ttgcagtttt ctgtttttgt gttgtctttg tctggttttg ctatccgtgt 22440
 aaatctggcc tcataaaatg agatgggaag tattctctcc tcttcttttg tttttttgga 22500
 agagggttga taaaattgag gctgaatctt ggtggttgcc acaatgacag gaactatttc 22560
 tgtgactgaa tatattggga attcctataa agcaattatt ttctagggaa gtggaaaaac 22620
 aacttttagcc aaagcaatct gtaaagaagc atttgacaaa ctggatgcc atgtggagag 22680
 agttgactgt aaagctttac gaggtatgag tatggtaaca ctctatataa atcccttttt 22740
 cattagaaag acaggaatgt tatacataat gctgtcaatc taataaatat acatatcatc 22800
 tagtctttta cttttctgtt tatcatttag tcattaaaat ttctttggct ttctaagtgt 22860
 tttgataaaa tttctaaaac tctccatatt taatggaggc ctattttttt ttctagccag 22920
 aactttttgt agactacatt tctggaagtg ctcaactgaca ccactctgaa aaattagtac 22980
 ttagaatata ctctaattgg tataaatgat ctctgaattg ctatggaaaa ctgggagaat 23040
 gttgtgctta ggggagagaa agtaggaggc tgtggacagc aatgaggaga attacagttc 23100
 accatataac actttttagc ttttaaagtc ctaacattt acattattat ctattcaatt 23160
 aaaaaatatt ggggaagatt tactttgaac agttaatttt tccccatgg gtaccgctgt 23220
 catatagttc caactaatca tgaacttggg tattttctgt tctttgtaa tttaaacttt 23280
 ctaactcacc aggaagtgtg aagccaaatt tgtgtttcaa atatagcaac tccaggatct 23340
 ctaggcagat gcatttgcatt ttgattttaa atgaatcttg atcccttact ctcaattatg 23400
 ttttccaca tctacttttt tttattttgt tgaagccat ctaaaattct caatgggatg 23460
 aaactgggta taaatgaata catgcataca ggaattatag tagcatatct cttttctttt 23520
 tctttttttt ttttttttga gacagagtct tgctctgtag ccaggctgg agtgcaagtg 23580
 tgcatctctg gctcaactata gcctccacct ccagggttca agcaattctc gtgcctcaac 23640
 ctcccgagta attgggacta cagggtgcatt ccaccacacc tggctaattt ttgtattttt 23700
 tagtagagat ggggtttcac catgttggtc aggtgatct caaactcctg acctcaaagt 23760
 gatctgcctg cttgtgtttc ccaaaagtgt gggattacta gcataagcca ctgcacctgg 23820
 cctccttttc tgagttttat aaaatttgat actttactgc acgctttgag actgtattaa 23880
 ttgaacctg ttgatgaaca agttttttgt atgggtatat taataaaaa tagatcaaat 23940
 ttttatagtt aaatcaatat cgagcttttc tagtgcttcc aaaaggacaa cctgaatttt 24000
 ccagcactg aaatgatact gaaaccattt catatcttct gtattaagga aaaaggcttg 24060
 aaaacataca aaaacoccta gagtggtctt tctcagagc agtggtgatg cagccatctg 24120
 ttgtctgct ggatgacct gacctcattg ctggaactgc tgctgtcccg gaacatgagc 24180
 acagtcctga tggcgtgcag agccagcggc ttgctcatgg taaatgcac caccactggc 24240

Ttaaggtctt gttcttttgt cagtcagcat ttttagtctt aacaataaat ctactctctt 24300
 cagagaataa tatatgtgtt atgttaagtg ttgtgtttga ggccctcgat gccattctac 24360
 agttgtccta tagactgtaa tagcaaaatt ggtagagtaa aaacagtggt aaaattctgc 24420
 aacttcattg ttagtccttt agggtttttc attctccctt acttattgtt taatttacag 24480
 atttactctt ttgttcattt gacaaatatt tgtcaaatgc ttgtgcacag tctgtattct 24540
 caaattctag gagaaaaaga aggggtgaaca gtattagcgc agaacgatac taataatgat 24600
 ggctactgtg tatgagttag cagccctttc ttggctttct tggattgctt tgtattctac 24660
 atgaagatat tccctgggct ttacagggtc ataaatggaa attcagagag attaatttga 24720
 ccagggtgac caacaaggag atgacagcat aactatgctg agaagtatac acagagtagt 24780
 gtaggagcat ataacctaaa ctgggggtga ggtgggataa ggagtattca gggaaggctt 24840
 tttggaggag ttgacaactg agccgagttt tgatggaaga gtagaaatta gcatgaacca 24900
 atttcattgct aataaagaag caaaggaagc gtggtctaca ggcaaaagca cagagggtaca 24960
 ggaagtaatg atatgtttgg gaataccctg ttgaactggag cttagagtgc aaggagagga 25020
 ttgctagggg ggtgaggttg gagggtttgg cagcattgac ttgcttcaag gttcttaaga 25080
 gctgaaatag atataaaatg caactaagag ttgcttggat tattattacc tagtgtgtta 25140
 ttctaaaatt ttgaaatcta tagcatctat aggaactggtt ttactaatct tacactcgat 25200
 agtttactgt tcttatacta gatctattag tccagtgttt aaggagtggt tgcagatttc 25260
 taggtcagga caggactcag atgtacatta ttaatgccta tttcagttct gacctctcca 25320
 ttgtgaaacct tataagacct ggggtaggaa gagattgttc tggaagtcat aggaatatga 25380
 attgtatttt gtttaacaaa caatacagta tggaaattta tcacctcttc agaataattta 25440
 tttcagagac aaatttttat cattcgttca tttatttcat aagatccagc agtaggggac 25500
 ctcaactagac attgctctga gtatatggto tgagtttgca gtacctcttg tgtctccatt 25560
 agattttatta ggtcctcaat agataaatca gggaataact agatggattc attttttaaa 25620
 gacatgaaag agcgatacca tacatactgc accttaaagg tcaaccttag agtatcatta 25680
 tttttaatga atgtataatt tttaaatttc atgtttactt ttcttaagct ttgctactat 25740
 attgcttaat tccagctttg aatgatatga taaaagagtt tatctccagt ggaagtgttg 25800
 ttgcaactgat tgcacacaagt cagtctcagc aatctctaca tcttttactt gttctgtctc 25860
 aaggagtcca catatttcag tgcgtccaac acattcagcc tctaatcag gtaatacact 25920
 acttgtaagg attattgaat tatgtccctt ttatagaaat tatttttcaa ttttattagt 25980
 aattcgtggc ttttaattta tgcctctctt aatgatttta aggatattga agtcaacatt 26040
 tgggtcatat tgtgctagag gcataaatta taatttatag ccacctgaaa tgttagtagt 26100

tgcgttccaa gaaaatgact tttttgaaa tgggtattct ttgaatgaga aagaacagag 26160
 agaaatagat agatggcttt taaacacttc attaatataa cttttttttt ccaccatcac 26220
 ataatggcac ttagtccctt ttgggaactc atgaggggtt tagtggtagt gagctgaaag 26280
 aaatatgttc caggactggc aaacatatct taaattcttt aaaattttca cctagcatct 26340
 accctaaata ttcagacctt gtgctagtta actgctattg aagaacaaag gtattatata 26400
 tattattaag gataatagaa tgggtattga gatattggtc attgaatatg aatatgtttt 26460
 gagaataaag ttttatagga accaaaaaaa aattcttaaa ggaaccatat attactaaaa 26520
 atgcttctta ttggagaaag aaatgacaat catttattaa tgtgattttt tcacaacttt 26580
 attaatgatat aattttaagta caacaaactc acataaagtg tacaatttga tcagttttaa 26640
 catatgtaga tgccatgaaa ccatcaccac aattaaggaa acaaacattt tcatcactcc 26700
 agaagtctcc tagccctttt actaccctt cctccctctg tccatcccca gacaactacc 26760
 aatttgcttt ctgtcactat agattttgtc acctgatttt ctccaaatat acattcaaaa 26820
 atatacagtt gaatacaatt ggaaatttga attttgtgtt tttttcttta ggaacaaaga 26880
 tctgaaatto tgtgtaattg aataaaaaat aaattggact gtgatataaa caagttcacc 26940
 gttcttgacc tgcagcatgt agctaaagaa actggcgggt ttgtggctag agattttaca 27000
 gaacttgttg atcgagccat acattctcga ctctctctgc agagtatatc caccagagaa 27060
 agtatgtttt actattaaaa cctgaacttg gaatcttctt tctattgttg agaaatgtaa 27120
 ttgtagtaag acaagaatta aatatattcc attgtagtat ttgaataagc agttatttga 27180
 ttgagaaaatt agtgtttcca gctaagatga tggcatattt tgaataatca tatagtgaat 27240
 ttaactagta aaagaagttt tgtttatttt taaacagaat tagtttttaac aacattggac 27300
 ttccaaaagg ctctccgcgg atttcttctt gcgtctttgc gaagtgtcaa cctgcataaa 27360
 cctagagacc tgggttggtg caagattggt gggttacatg aagttaggca gatactcatg 27420
 gatactatcc agttacctgc caaggtatgt ttaaaaaaag aaaaagttaa tacttactcc 27480
 cagaagaacc actgtattat tggctttggc tttatgtgtc agcttgccca atctcctgtg 27540
 gagtcaacaa gtgtttactg agttacccaa taaatgtctt aacactattt taggtacttt 27600
 aacaaatttt aattttatta attaattttt tattagaatt gagacctcac tctgcatctt 27660
 aggctggagt acactcacag ctactgcaa cctcaaaact ctgggctcaa gcaatcctcc 27720
 tgcctcagcc tcccagtag ctagaactac aggcattgaac caccatgcc ggccaaactc 27780
 ttaattttct tagagacgga gtcttgctat gttgcccagg cagacagatt ttaatgtgta 27840
 tgatgcagtc tttgatgata agaaacttat aatggaaagc tgaggtgata gttacagtaa 27900
 atacattttg atgtataatt ctgtttgctt taatcattca aattgtagta aagcaagatg 27960

aactgtctgc tgggatttga gcagaaatgg ataggaataa actaggaggt agaagagtta 28020
 tcaagggttca caggactgat gggatgaagct agatttccag acccgggatg tcagtccttg 28080
 aaaagcagac ttggcaggca tagacgagcg agatagcagg ataaaggaga caaatgtaga 28140
 ttgttcttca gaagatcaga tggtagagtc taggaggttag tgtgttttaa tcagagatct 28200
 gagaggcaaa gatcattgca tgagatcagg gacccatgca aaggagttag aaaaaaact 28260
 ggggttaagga gcctgctgca tggcaactcc tgggaacagt ggcactggg gcctgggaca 28320
 tgttgattgc agccaggagc tgttaaaacc agtgtgagag aacatgggta tggaagtact 28380
 agctagcagg atcatgaccc cgatgctggg atggggcatc aagcattagt acatggagat 28440
 tcagtacatc cagatgcagt acatggagac tatatcgta actgctgact ttgggcttct 28500
 ttcagattgg agcagaggta gaggtgagtg ggaatattct caatagaggg aactaaatag 28560
 gcatacctaa taaaggagac caggatattg cacagcagtag cctcatgttt ggctcacctg 28620
 ttcacaaaagt tctcttggtc ttgagcagtg gtgccttaaa aggtaacttg agaagcagtc 28680
 gattatttgc tcagcctgga gactcttggg atattttact atcttggatt gaatagattt 28740
 aatgtacac agctctcata acttgcccca tgaagcatat ccatgaaagg cactatactt 28800
 gtttaaaagt tggtttgtac tttttaaatg tagtactttt aataaaacag gaaaaataga 28860
 agttctgatg cagtttatag cattttatat agaatgtgtt cttaattgga aaaaatttgt 28920
 ctgtgttctt ttgagttcat ttacagtttt tagtaggaat tgtattttct actgtgtgac 28980
 ttgctgttac taaagaaaga tggctgtgat taccatctga atttttttct tatacattga 29040
 ttttttagctg ctacttagtc atttctgttt agacttgagc tcttttttct attttttttt 29100
 tttgtttctc agtatccaga attatttgca aacttgccca tacgacaaag aacaggaata 29160
 ctgttgtatg gtccgcctgg aacaggaaaa accttactag ctggggtaat tgcacgagag 29220
 agtagaatga attttataag tgtcaaggta tgttgtctac ttatcttctt tttttattta 29280
 ggtaaaatta acataaatgc agttagccat ttcaaagtgt aaattcactg gcatttagtg 29340
 cattcacaat gctatgcaac caccacctct ctctaatttc aaaaactttt cattccactc 29400
 ctctcttgc ttatccctg gcaaccatto atctgctttt tgtctctatg gatttgcctt 29460
 ttctgtatat ttcatataaa acaaatcatg caatatgtga ccttttttgt ctggcttctt 29520
 tcacttatgt aatgttttca tggttcatcc aggtagtagc atgtatcagt acttcattcc 29580
 tttgcattgac tgaataatgt taccatactt tgtttatcca cttatcagtg gtgaacattt 29640
 gaattgttcc taccttttga ctattatgaa taatgttgct gtaaatatcc atgcacaaat 29700
 ttctccacgg atatgttttc atttctcttg ggtataaaact gaggagtaga attcttgggt 29760
 cttagggtaa ttctctaact tttcaaagaa ccaccaaact gtctttcaca ccaactgcac 29820

tattccact agcagtgtg ggggttcctg attctccaca tctttaccaa caccattatg 29880
 tttctcaatt gtgggctagt ctacacattg gaaagctagt gggagcagcg atccatctat 29940
 taaaagtgtg atgaaattga gtaatgagcc acctctctct tgtagggtctt attatgttct 30000
 tgcttaaggc aatcttcatg cattgtgaac agaattatac ataaatgctc agataaaaag 30060
 gcaaaccatt cttaaaggga gtacacaact agaggcagga gaccatactg aggcaggaag 30120
 ctgggggttt tatgtttctg ttacttttga ctatatctca ccattgcttt tgtcaaaagt 30180
 agactaggtc taagtttttt tcagggtataa ggtgagtgtg gtaattaagg ggcagtctag 30240
 cagatcattt tgggtaatgc ttcacagtc accactgggt tgtcattgtg gtgcagatc 30300
 cagtatctta gctgtgtaat ttcagacatc agcaatatta gtttaacaaa gggaattag 30360
 attccaagac aaaggaatcg tgtattatct tagccttatt caaacttgat ttataaatca 30420
 gtttagtaat ttattttatt gtttctgtat ttatttttat ttctttgaga tggagtctca 30480
 ctctattggc caggctggag tgtagtgtg caatcttggc ttactgcaac ctctgcctcc 30540
 tgggttcaag ctattctctc gcctcagcct cccgagtagc tgggattaca ggctaatttt 30600
 ctatttttta gttagagatgg ggtttcacca tgttggccag gctgggtctg aactcctgac 30660
 ctcgagtgtg ctgcccgcct tggcctccca aagtctctggg attacagagc tgagctaccg 30720
 tggccagctc agtttagtaa tgtataactg ggttttacc agtgttaaat tactcttttg 30780
 tgggtgtttt ttgagaactg gcaatgacgg agaaactaaa agtgccaggc tgttgccctg 30840
 ttcctgttat tttgccttag tttttttttt tttttttttt ttctctgaga ctgagtcttg 30900
 ctgtgttacc aggctagagt ggagtggcat gatctgggt cactgcaacc ctgcctcct 30960
 gggttcaagt gattcctgcc tcagcctccc gagtagctgg gattacaggc gctgccacc 31020
 gcacccggtg aatttttcta ttttttagtag agacgggatt ttaccatgtt ggccaggctg 31080
 gcctgcacct cctgacctca tgatccacca gcttcggcct cccaaagtc tgggattaca 31140
 ggcgagaacc accgtgcccgt gtcttgccct agttatttct tgttccctcc tctagtccta 31200
 tagttctctg actgtattga ggaaatgtaa ttaaattatta ttatgttaat agatatttat 31260
 gtgggtgaat attagaaatt cttatttttg gtcacatctc ctgatcagta gttgtcttc 31320
 tggagatagt gatttttctc tagagatgac ttaggacct attcagggtt tttttaagat 31380
 cccaatttaa ggaaagacta ttctcattat tgattttgct atatgcaggg aaattttatt 31440
 cgaaaggttt ttcagttggc ttttagggaa gattatata tctctttttt tttttttggc 31500
 cttttccac atgttctaaa aatgatata tctttaactc ctatgaaaat acattgtttc 31560
 agtaattgaa gatgctgatt aaagtcatat ctctacacat tttttaaaat ttgagataga 31620
 tgggactttg tcccttctta caccattcac ttattcactt ggaaaaacta ttatccaata 31680

tttatgtggc agacactggt tctggcacaa gggattcagc agtgaacaaa actgcctttt 31740
 tggagtttac attctactag tggaaagcga caacaagcag atagacacat tcagtatata 31800
 attcaactgc agatggtggt ggttaagtct atgtaggaag aaaagcaggg taaggaggct 31860
 tggagtaact ggagtgaatc atagatggac ttgtcaggaa agggtttctg aaggagggtt 31920
 atttgggcag agatctaaat aaaatgaagc aacaagccat gagaatatcc gggggaaaat 31980
 gttctgggca gaagcatcaa gcatagaact tgtggtatga tatttatctc agcacacatt 32040
 aattttaaaa atgtataaaa gacatccatt taatcatatt aaagatttcc atgatttcatt 32100
 tagacttagt cagaaaccaa atttatattt tcttttttaa taattttatc tcaactctta 32160
 tttaccocaa taggggcccag agttactcag caaatacatt ggagcaagtg aacaagctgt 32220
 tcgggatatt tttattagggt tggtagccta tgaatgtttt taaagtaact gactctgtta 32280
 ttattttatc atcagtgctt tttttggtct tgttttttga agaactgata ttgaaacctt 32340
 ttgggtttatg tgaattatta ataagctaga ggacgtggat tctctatttc atcaaataat 32400
 ttaaaaacatt ttagatatta aattttggaa attatttggt ttgttttacc aatagaaaata 32460
 ttctctcaag tggaaatcgaa gtggttatcc aaagaaatct cagagtagat tcttatatga 32520
 agcaaataat tgccccctaat ttatctctaa attttgaag ttctaaatcc ttttttcccc 32580
 aggtttctaa tttatctctt ataagtcga agtccatctg gccaatctaa ttctagttag 32640
 tcttaactatt ttgcataat taaaaaactg tatatgaata cagaagatgg tatttaagga 32700
 tgaataataat tattcaaatg tgatagcatt atggggagtt ttaaaaaaaa agttactgtt 32760
 ttattcttcc aaaaatttta ttataaagta tacagttaag agaataatac taaaatacat 32820
 atgcagctta aggaagaata ataaaatgaa tacttcatgt attcaccacc gagtttacca 32880
 ggaaaaagca taaacaaaaa aaacctcttc cactgaatcc ctgggtttaa gagaagttat 32940
 agtggaaaat atttgggagc aaacgataat gaaaatacta tccattaaaa ttgttagatg 33000
 ttgcaaaact gatttcaagg aaaatttata gtgttaaatg tttagaaaaa aaaaaagggt 33060
 agaagttaac cacttatgta tctatctcat gaaattagga aaattataga tataaactaa 33120
 aaaaatgttt aaaaaggaaa taataaagat aagaatgaag ttaaatgaaa cacaaaacag 33180
 agaagctcac aaagccaaga tttatttttt gaacaccgag tacaattgac aaatctctaa 33240
 caagtttgat taagaaaaaa gaaagcatga ataaacaatt ttagggaata aaagggaac 33300
 atcgctaaag atatccocaga aatgtaaaaa ataataaggg aatattatga aaatattcat 33360
 gccaatcat ttgaaaactt aggtgacata gacaaaaaca aaattgacca aaattgagca 33420
 aaaaagaac aaaatctgag tagtctgtta acttagtaaa aattgagtta gaaaagttaa 33480
 agaagtcttt acacaaatca aacatcagac tcagttttct aggagagttt tgccaaacat 33540

Tcaagtagca gataattctg gtctattttt ggccccagaa gatataattt acttgccatg 33600
 catttaatga gatagctgtt gatttttttc aatcaccgtg acagggtgtt tatattaggt 33660
 gttattcgcc agacatctag tccacctgtt gccagatag gaattaatat tcaactattt 33720
 tgaattaaaa tttgttaata aattaataaa acaaagtcaa agttcaaatt attaaaaaag 33780
 taaaagaaat aaaatatatt ttatagagag cctttacaaa acagtaccaa cataatgagc 33840
 tttccaaatt tggaatgggc aaaataaatg aataggcatt tcacaaaaga aggaaggggtg 33900
 gccaaataagt atatattaat ataaaaatgg ttacttgtaa taggaatcaa aagtgtttga 33960
 cttattgact aagagtcagt ttttgttttg atocctgtta gtctatcoag aaggoatggg 34020
 tcttaataaa caccttgacc tcaacagttt actgaataca agggtaattt catatgcctt 34080
 gccttcttta aggggtttgtt gtaaagatta aaataaaatc ataaatatat ataaatacat 34140
 ttatatgtat ttatatgtaa ttacatacaa cttgccttct ttaagggttt gttgtaaaaa 34200
 ttaaaagaag tatataaata tatataaata cataaaataa atacattcat atattgtatat 34260
 gaaatcactt tgccaaactat gaagcctgat tcaaataatga aatgtgtgtt gtttttccca 34320
 ggcacaggc tgcaaaagccc tgacttcttt tctttgatga atttgaatcc attgtctctc 34380
 gccggggtca tgataatata ggaggtacag accgagtagt taaccagttg ctgactcagt 34440
 cggatggagt agaaggctta cagggttaata attataaata cagaaataga atgttataac 34500
 aaaaatgtcat catgtcatca gattttggta aaaaaatgtt ctttttctct ctagggtgtt 34560
 atgtattggc tgctactagt cgcctgact tgattgaccc tgccttgctt aggcctggtc 34620
 gactagataa atgtgtatac tgtctctctc ctgacaggt gacaatttca tatttagagt 34680
 tcaaaaacca acaaatgcta cactctttcc ttgtgagctt tacttctgcc aggtaatggc 34740
 aattgtctct agaagaccag ctttcttagg gaaaagcttt agccactgtt tgcctaaaagc 34800
 ataaaaagat tctgaattag atgcaaagcc tttttttggc ccagtgcagg tctgaaaact 34860
 ttgtaatcct tctgtgttgg ctgattgggg aaaaaaaaaa gcaagaacc taatgtatta 34920
 tattttcaca ttatcttctg ttcaaagatt acatacttcc attatcctgt caaaaaaaaa 34980
 actctgatac agaatacaag atgtgaatcg taagcatgta agcaggttcc atagagataa 35040
 tttttcaact cttccttgtc ctgtgtgtt ccaactotta ttctccaatt tagaagcaaa 35100
 caaataaatg aatgaaagaa cagatagaca aatgaatagt caaaggtata aagtatctgt 35160
 atatattgta catgtagcta ttatttaaat tatttagatt ttcttttga aataccttct 35220
 tggcacactt gcctaaatct agaaaaataag cactgtgtga ataagaatt atttacaactg 35280
 aatatttgt aggtttttgg gttttgttt ttccagacaag gtctcacttt gtcacccagg 35340
 ctggagtaca ctgttacgat cacaactcac tgcagcctct atggcccagg ctcaagcaat 35400

cccccacct cagcctcccg agtagctggg accacaggca cagcctacca tgcccagata 35460
 attttattat taatttttgt atagagatgg ggtctccctg tgtgcccag gctttcttga 35520
 actccagggc tcaagtgate ctcccacctc aacctcccaa agtgttgga ttacaggcgt 35580
 gagccaccat gccacgcctt aagagtgtt gattttcatt cattttccta tatatattat 35640
 ttctgttggg gaaaaaatc caaggaagat aaatagtagg ctgttggtac atttctcaac 35700
 ttactataa agcttttttag atatataagg ttaatttatg aagaaaatca taagatacac 35760
 aatttaagat aatattttta attttatttt ttatttgtta aataaaattt tctcctttca 35820
 ggtgtcacgt cttgaaattt taaatgtcct cagtgtactct ctacctctgg cagatgatgt 35880
 tgaccttcag catgtagcat cagtaactga ctcttttact ggagctgac tgaaagcttt 35940
 actttacaat gcccaatttg aggccttaca tggaatgctg ctctcgagt gactccaggc 36000
 aagttatatg aggaagtgtt tatgacattt tatgagtgt aaaagaagta caatgtcaaa 36060
 atttccacct taaaaaatgc tattttttta acaactttgg taaactgta tagaaacata 36120
 attttacctt tagttgaatg ttccatagtt ggaatatggg ttttgccag aatttataat 36180
 tatgaagttt gatgtctgtt tctttaacat taccttaata ttggcaaaaa catgttggtg 36240
 ttgtcaagga tattatttaa attgggatac catgaattaa atactacaaa caaaaataat 36300
 tagagttttt tgtttgtttg tactttaact tttaaaaaat aatcagttaa agtgttgttt 36360
 tgaagctca cattgtttca atctggccaa taggagcccc ttttgtatgg ctctgtatc 36420
 ttatgacat gtctcatca ttcttgaatc acttctcac ttccagatac agtaagttat 36480
 ttttgccag gtgcagtggt tcacgcctgt aatcccagca ctttgccagg ccaaggcagg 36540
 aggatcattt gggcctagtt tgagaccaa tcatggttgc acaaaactgta cccactatgg 36600
 acaacagagt gggatcttgt ctctgtgaaa aatttaaaaa ttagctgggc atggtggcac 36660
 atacctgtag tcctagcttc ttgggagagg ctgtggcagg aggatcgctt gagtataatc 36720
 aggatgcagt gagccatgct tgtgccactg cactccagca tggatgacag aatgagaccc 36780
 tgcccccaaa aaagaaaaat attcttggtt tatcttgtac tttctgtatc ccagccctag 36840
 catcagcctt ttctctaaa acagtattat gatttttaata ttacagtag atatttgaac 36900
 tgttacatta tagactttac catatatttt ctagggaagga ttattctatt actcttcttt 36960
 aocacatttg tttggaatgt ctacagaacc tacagtttct aaatcagaaa ctccctagggt 37020
 ttttgctatt ttggcaagcc attgaagtgc ttccctctcc ctttactacc agaaggtgtg 37080
 gtattttagt agctctctat aatgagaaa cactctataa catggttgat tcatcatttt 37140
 ggagtagaaa agtatgaatg gaaagtcaga gacataaaaa taaagcccag aggtctgagt 37200
 cttagcttca ttacagactt tcttggggga tgggtggtaa attatctaca cattctatct 37260

Tgtctttata attttaatag ttaaatTTTT accatgtgcc tcaaaaccgt tagagaatta 37320
 atgagctctt tgaaaaatgc ttctaagttt ctgtatttgc tctaatagaa tgctatctat 37380
 gttattattt atttctgaga ctaaaattgt ttacatcttt aaactggttg tctttttgtg 37440
 tatttttaga tggaagttcc agctctgata gtgacctaaag tctgtcttca atggctcttc 37500
 ttaaccatag cagtggctct gacgattcag ctggagatgg agaattgtgc ttagatcagt 37560
 ccctgtttc tttagagatg tccgagatcc ttccagatga atcaaaattc aatatgtacc 37620
 ggctctactt tggaagctct tatgaatcag aacttggaat tggaacctct tctgatttgg 37680
 tatcttgtgc agtcatcatt atacagttct gaaatataaa gctatatgtt ggtgtaaagt 37740
 tgcagtgtatt tctctcctaa ccagccccac atattcttcc tggttggttg gttcttcagt 37800
 aaaatagtct tgtttcttgc ttacactaat tggtaatttg cattctctgt taagattttc 37860
 aagacagggc tgggagcaag gaaccaaaat agcgcgtggt tgtgattacc ttgtgtttct 37920
 ctgaggttct tcttacctag tggctttaa acatcttttag gacgagttcc attttatagt 37980
 aaacttaaat tctgttatca tgaacagttg aggataatga ataatttgat acaataatgt 38040
 aggaatttcc tgaaaacaaa gtgttatctg tgatactttt gctgcatagt aagcacatg 38100
 agtgtactg ataattgttc aacaggaaa gtgtttgatt aaatgtgggc agtatcactg 38160
 tctactagc attcaacatc tcttctaaaa attaatagtg gtctactgta attttattgg 38220
 catgtaac atctgtacat gtgtttggtt atctatatgt ttctgtggtt ttgttacatt 38280
 gctttatta atttaggett ttttttttt ttttttttga gacagttcca ctctatcctc 38340
 gagactagag tgcagtgcca caattatggc tctactgcagc cttagacctc tgggcttagg 38400
 gattcttcc acctcagcct cctgagtagc tgggactaca ggcacatgcc accatgcccc 38460
 gctaattttt gtatgttttg tagagacgag gtttcacat attgcccagg ctggctctca 38520
 actcctgggc tcaagctatc tgcgtgcctt gacctcccaa agtgctagga ttacaggtgt 38580
 gagccactat gcctagccta actcagactt taaaaatata aaagcaattc attttatttc 38640
 ccaagaacag taagggtggt gttaatttt agtttttaatt tctgttttta atttatttca 38700
 tttagaaatg tcccagaaac ttagtataac ttacttttct gaaaatgaag aaacctgtcc 38760
 ttgggcatta gtgtgttgga tttaagcaac aaagttaaaa aaacctaccg tgtgttatgg 38820
 caattttcac ttgatggtgg ttctataaca caggtatcag tgaaccttta taaaagatga 38880
 acaacttttc agcttgctta atttcagtta attaacatgt atacttatct atgttaatgt 38940
 ttatttgctt aaaaatgtta atttttatat ttggtaaaca gatagttttt tctctcccc 39000
 tcttcttcc atcttccatt actacaattt accatgcaga gctcacaatg tctctctgca 39060
 ccaagctcca tgactcagga tttgcctgga gttcctggga aagaccagtt gttttcacag 39120

tctccagtgt taaggacagc ttcacaagag ggttgccaag aacttacaca agaacaaaga 39180
 gatcaactga gggcagatat cagtattatc aaaggcagat accggaggcca aagtggagta 39240
 tggctttttc cccctcatta taattgttaa aactttctaa aaattgttc acccttttga 39300
 tataatattc tttgacttat aaacgagcta tatttataaa caagggacca gaacacatta 39360
 actcagtcac ggttatgtgc ttccttgctt tcaatgttc attatcttat aaggaagaga 39420
 acgtatgtgc tcttgaaaaa actgacaata agaagtaaca actggactac cacatttttt 39480
 tttacatcct taatttaact ctctgcataa ttcctttttt acttaaggag gacgaatcca 39540
 tgaaccaacc aggaccaatc aaaaccagac tggctattag tcagtcacat ttaatgactg 39600
 cacttggcca cacaagacca tccattagtg aagatgactg gaagaatttt gctgagctgt 39660
 aagtaacaga ttctgttttg gaagtacagc tactattaca agtgacatag tattacactt 39720
 aaacctttta agtctcgtgt taaaataaaa atattttgaa tatttaaaag ctaattcaaa 39780
 aatattgtgt cgtagctatg cattaaaaa ccccaaaatg tcagaagtac agaagtcaaa 39840
 attgagtttt cattaaccag ttcatttgat tatatttgaa ttattcataa tggactcatt 39900
 taattttagt aactttgggc tgggtgctgt ggctcatgcc tgtaatccca gctctttggg 39960
 ttggccaaggc aggtggatca cctgaggcca ggagttcag gcaagcctaa ccaacacggg 40020
 taaaccccat ctctactaaa aatacaaaaa ttaggccagt gtggtggcat gtgctgtag 40080
 tccagctac ttgggaggct gagacaggag aattgcttga acccaggagg tggaggttgc 40140
 gtgagccga gattgcacca ctgcactcca tccagcctgg gccacagagc gagactgtgt 40200
 tcaaaaaaaa aaaaaaaaaa atttagtaac ttcgaagaaa taagaaggaa aattaaaagt 40260
 tgaagtgat tctaattgat agtttataaa attttgttat aaaaatacct gttttgcctt 40320
 caaaaataatt tatattaata ttttatggac ctcaagaaca tttaaataca ttcagattta 40380
 ttcatttggt gaccacattt gttatacatt ggatttaaag gatccttgca attgagttta 40440
 tggccacctc tgcactctgag acccatggac tgggaacatc tctaggtcaa tgattcagtg 40500
 tgattcaatt taagagatgt ttattcctgg tctttagaag ctgctacctt ttgttatcta 40560
 attttgagct actttgaagt atgtatgtat gtgtacatac gttagtgtca tgtattttatt 40620
 aaagaagaat cagaaaaacag aggttaaggaa aaataaggaa acaattttct gtttaagccca 40680
 ccacctccca aagcatattt gtttatatgc ttatatatgt ttctctatta tggtaagaac 40740
 agtctgtaca tattgtcata tagcagtcac cttttatcca catcacctct gaaaattgtt 40800
 ttacatttta aatgttaact actttattgt ttttaaatgt cattttatag ttagctatg 40860
 ccacaatatc caatttttag acattttaat tgcctccagg caatgtgcta atgaacattc 40920
 ttgcagctga atatatgcac atattctaatt gtttcactag gatagagggt gaattgtata 40980

acaggagact cacatttttt aaggcttttg aaatgtattg ccaaatgtcc tgccagatat 41040
 actgcacat cactaacatt gtgtgttgca gtatttttct aaactgtgcc cttttgattt 41100
 tagaaaaatg atatcaataa ttacatttct ttgtattaaa gtgtagaagt tataattttt 41160
 catattatto attgtcattt gtattttatc ttttctaact tgtctcttca tcccccttgc 41220
 tocgttttct attggagtgc aactttattt gtaagaattc tttttaattt ctgtgactgg 41280
 aatttttttt tctagtttgt tatttccogt tcattttctta aaatataatt gtgtttgcc 41340
 acaatccatt atctttttgt ttgtaatggt agtatttata catattaaat tatctctttc 41400
 ttttttcaga tatgaaagct ttcaaaatcc aaagaggaga aaaaatcaaa gtggaacaat 41460
 gtttcgacct ggacagaaa gtaactttagc ataaaatata cttctttttg atttggttct 41520
 gtttaagttt ttgatggctt ttccatatgt tgtaacagga aaaaatggt gtctatgaat 41580
 ttcttcttaa ttttaacaaat ttggttaatt tataaaatca cagatttgga aatgctataa 41640
 tcatgtaatg atcaggattg agattaatac tgtagtataa attgggacat tataacagat 41700
 tccatatttt atttctctaa atctaaatto agtctttaat gaaataatat tagccaaatg 41760
 ttgggaactaa tttatttctt ttgaggaaaa gataataaag aatgtaatta aatttaaat 41820
 ttttgggaatt cccagttgta tattcatcac ctttgtagca ttgacaaaat tttatgctta 41880
 tctgtctctt cactgttttg aaataaaata tcctattacc tactgatata attatctgtt 41940
 tttgtatat caaaaaatgt gaaatttaca cataattcaa atacatttaa ttatccgctc 42000
 taccagaaat gaaatcacat cctctacta tactacatcc agctccaagc ccaagatatt 42060
 tcaatgacat ccatctctct cctagttcca gttatgattt tatcttgata ttctctcata 42120
 tatgaactaa attataaagt tagccaccat caatacaatc tgcgtatcta atatcttaac 42180
 tatatagtaa tggggtaagg gaacagcaaa aaggagaaca ttaattaaaa tatacaagta 42240
 agcctgggca acatagttag accccatctc ttaaaaaaaa aattagccat gcatgatggt 42300
 atgcctctag tcccagctac ttgggaggct gaggtaggag gatcacttgc tcccaggagg 42360
 ttcaagggtc taaaccagca aagctcagaa tcccagggga tagaaacaaa gacttagtgg 42420
 atcactagta ttaaactgag acacgtcacc ctgcattgca ctttgtttct cagttctttg 42480
 atgaaatcac tgagctgaca tacctgccct cttttcacca taaagtgagt ttcatgatca 42540
 gaagcaatgt ctatgggata gcctaacaaa caatgtaaaa accatttagt aagttcatga 42600
 aggggtggtg tggtaaaaat ttggagaaca tacaaaacaa atacaattcc aaggtgtgtc 42660
 cctccagga aggacaaatt gotgcctgct ctgtgataga agaggatcag atgtaataca 42720
 cctgcogtca gacttgggt gttctctct gggtgtggac ttgcctggtt ggtcactgct 42780
 gctgacaagt aggctgtcaa tatagctggg ttgtcatgtc agctgtggtg agggggaagt 42840

ccacattgtg gaggccacat cctgcactc ttggccaatt tgaccatgaa tcttaagcac 42900
 tgggggtggct ggaanaagaca gccgattgac atccatacag aggtcatctt gaccacttga 42960
 ttagtataag cactgaaggc ttttaactga gcattcacat aggacacaaa tattctgatt 43020
 ctttggggccc attccaagaa ctctgggcat acttttccct cagacctcat acccagttgt 43080
 gtcttttcca aatttctggt catctgggta tgttattagc cactatctgt gaatcagcat 43140
 agatttttat atcagacatc tctacctcct gacagaatgg aggagatatg ttacttaaca 43200
 attctgttcc cttggaagat ttctgtgtct cactgtttgt aagggtctact cctcaatgt 43260
 agcagtaatg ctttctactct gatgggaagt cacagtggaa ttctgggtct ccaagaatta 43320
 gtgttagtgc atacacagt tctgataatc cccagagtgt ctgggtccct tggatcctgt 43380
 gaagaaggct tgggaaaaag aagattcatg gcaagaactt gtgatgtgat gacagggcct 43440
 ttctctggc tcttctattct tagtctgacc taggtgtgag aattaggcca ggggccatga 43500
 ctatattgtg gtgactcaaa ccaggccttt gtttactaac tgggagattt ttacattgta 43560
 agaatacaagt aggatctttg cccatgtatt ttggtcttaa gaacacaaa gatattggctc 43620
 caatgactgg aggaacacca gggtccttgg tctcacgctg atttagataa aacgactgtc 43680
 aggcctctga gcccaagcta agccatcctc cctgtgacc tgcacgtata catccagatg 43740
 gctgaagta accaaagaat cacaaaagca gtgaaaatgg cctgttctct ccttaactga 43800
 gacattcca ccatgtgat ttgttctg cccatcttaa ctgagcgatt aaccttgtga 43860
 atttcttct cctggctcaa aacctcccc actgagcacc ttgtgacccc cggccctgcc 43920
 ctaagagaa aacccccctt gattataatt ttccactacc caccacaaat ctataaaatg 43980
 gccccacccc tatctccctt cgctgactcc tttttcggac tcagcccgcc tgcacccagg 44040
 tgaataaatac agccttgttg ctcacacaaa gcctgttttg tggactctct tcacacggac 44100

<210> 64 <211> 16869 <212> DNA <213> Homo sapiens <400> 64
 aagcttttagt agagatctca aaaatgggtg gatggtagca aattactaag aactctcaaa 60
 gtttctaag ccttagtttc agcttgctag aaaacctatg ttgagtatta tggctagttc 120
 catagttgag ttgggaaatg tctttgagga gacacttttt cactttgtat tcatctgtac 180
 attttctgtt acttgcattc tgtcatgctc aggcatttag agcaggtaga tttttataac 240
 tggaatgttt atgtgtagtg aagctctgag aggcatttgc attagatctc agcagcataa 300
 tcagaagggtt gtcctttgtc tcagcaattt ttaagctaag agtagcagaa attgcagtgg 360
 aaatagactg ctttgccaca acattcagaa aatcatttat ctttttattg cagttcttgt 420
 caccacaaa tacattttag tacttctcaa attgcagaa ctcacatagg ctgggaaaat 480
 gcctgtagac acatacatac tatgaatgtg ctaatgtttt ttgtattttc atagcccatc 540

aaagctctcg agtcagtttc cactataatc actgcagaat caatcttcta caagtaagc	600
ttttgtagag ttactgaagg aagagttggg cctagtggtt aatgtgccac taaaagtgtg	660
gattagctcta aaggtctctg ctactcttta ttgtataag gtgtgattat actttttgtt	720
cccttcttag ctgtttttcc ccataagtgg ctgttattaa aacatctcat cttagagctga	780
agtgggagga gaaagtgcct actgacacat gatgtgagga tcttaagtat ttttttttag	840
tgtagattgt aggaattatt cttaaaatgc tgattgtata gtgtggagcc atggaagact	900
gagccgttag tgcagtgcca ttgaagaatg agaaggacag agacaggatt tggactagta	960
gaggttgctg actgtggtgt caaatgggta gagtagggcc agagattcta aaatgccttt	1020
aagtggagtt gagctgagta agggcagtag tgaggattaa cactactag agaatcatag	1080
tgagaggaat tocaagatgt ttgtataaaa gaatgaggag gtcagggttc ccagggccaa	1140
agtcctagaa catctgatac ctgagtgaga gaagtgcag attgttgtgt ttaaaccaga	1200
agtccttaga aaggaattag aacatagacc ccaagggtc ggcaaggcctg gcacggcaca	1260
ggcagcaacc attgaaggct atttggtgtt tcgggatctg aactgtcatt taggggacag	1320
tgtgtgaggt tagtacttta tacttgacc aggtggactg agaaactcaa gtgatgatgc	1380
ctttaagtat actttttttt aagcccacaa tctatatagt cgaagtctgt tctctccaac	1440
aggggtacac tggcattctc cagcagggtt gggaaaaacc aacaacaaa aaagtctgta	1500
ccaggcaaaa catctctctt atttttccaa catttaatac attgttaata aaatatctaa	1560
agtttagcaa acagtgtctg tgtatcagtg gctgagcatt ttgcatgctt tatttcatc	1620
agttcactct atgaggtgga tactactatc cccattttct agatgagaac attgaggcac	1680
agcgaggtta attaacttgt ccaagatcac atagccaaca agtcatggag tgaggcgatc	1740
tcatgccaga gcttaagcct agagcatagt tcttggtctc acagcttagt caagtgactg	1800
gctatgtgac gaggaccaac ctctctaattg tctcatctgt aaaataggaa ttgtaaatag	1860
ttactacctc agtgggtcaa atgaatcat atgtgttaag cacttagcag agtaagcact	1920
caatgaatag taggagttat cacatcttcg tatttgtgca ttaccttacc agtttacaga	1980
ttaaggccag aagcaacttg ttgagctacg ggtttagtgt actaacagtt tccatgtgtg	2040
tctccatgga aggggtgtgt ggacctgtta ttgtgactgt ctgtactctt gtattgttgt	2100
ctgccacca tgtttattaa atgataagga caataatgca acaaagtagt caagtaatgt	2160
tgcaaatgcc cagtattgta gtggctatca cagcagtgcc actggcaggc agcaccatgg	2220
tggcaagttc aagaggtcac tggcagccac tgagctagag ccagatcag gcatgcaaga	2280
ggagcctgag tgggagccac tggggatcac ggccaagagt gtgaccaccc aagaccacaga	2340
atggctgagt ggctccctg gagcatggca gtggcagaac aactccatga actcagatct	2400

tgtgatgcct	aaactagtgc	tgttctcgtg	tggaccocctt	ttctctacca	gaaacocctga	2460
atcctctcag	caaagttagg	gactactcag	atcagtgact	tagtctcgtt	tgggtgttata	2520
tatgtgtaca	caacacagca	catattaata	aatacctact	atgtgccagg	cactgcctac	2580
cactggaatc	tttactaag	acattgtttt	tactttgcat	ttctgccttt	acactatgaa	2640
agtagatgtt	tggattcoat	attcattcag	catacatttg	aatatgctgt	gttatgcata	2700
gtaagcctat	gataagcaag	tattctcatt	tagaatttgg	gaatattgat	tatacatgtg	2760
gacaaacaaa	ccataaatgc	aaactattta	tatgataaat	aactttggac	tgatggctgg	2820
gagggaaggac	cagctattga	tgggtaggaa	ctagcaagta	gcggactgtg	gcctgcatag	2880
accagaccaca	tccgtagtga	tccagatgaa	acagccaccc	tcagacacct	ggataaaggg	2940
tccaccagga	aaaaactcct	ggcctatcag	gtgctatgtt	acagttcagt	tactgggaagt	3000
atttccctcaa	aagtgttttt	atggttggag	tacacattcc	tacagcttta	cctgctgccca	3060
atccctgtt	tcaagggaag	cagcaatgaa	ttacactgtt	cccgtagtca	aggacagtat	3120
actcttaccaa	gaactatacc	cacttaagga	gggtgtggat	gtcataaaga	tttggatcaa	3180
cgattatggg	tgttcagagg	agagattatt	tccagctcaa	gacccaggga	agaggacata	3240
ggatggatgc	cagagtcata	gggaggattt	aacacaggac	atgtacacat	tagttagtgtg	3300
ggatataaagt	ggaacagaaa	tgaatgagac	acaaagcctt	gaatgccaga	aatactagta	3360
gtcctgttgt	ggaaggatat	aaaactcaac	tgggagtggg	agagaaaggc	agcagtgagt	3420
ctaggagatg	tacagtaggt	tgaggtaaac	atatcctgaa	gactataaat	caaagattat	3480
tttgggttg	aatttgtttt	ggtttgaatt	catggtatct	attttctttg	agtggatgggt	3540
gggggagggt	ggcatgtaga	atgcattcct	accaaatcag	catgattttc	aagacagtac	3600
agagaaaaaga	ctgctgagct	gatgtaggag	cttggctgc	agtcctctatg	gctttcagca	3660
agccgtttta	ccttactact	gcttcatgac	tgtggctaac	aaagtaggga	tagtacggag	3720
cacagaggat	ttttaggggc	gtgaaactat	taatactctc	tttgtatgat	actataatgg	3780
tgggtacatg	tcattatata	tttgcccaac	cccacagaat	acacagcacc	aagagtgaac	3840
cctaagtga	actctggtct	ttgatgatgc	tatgtcagtg	tacgttcatc	cgtgtaacaa	3900
gtgtaccact	ctagtgtgtg	gaggggttat	tgataatagg	ggaggatgtg	catgtgtggg	3960
ggcaggaagt	atatgggaaa	tctctctact	tctgctcaat	tttgcgtgaa	acotaaaacc	4020
tctgtaaaaa	ataaagtcta	ttttttaaaa	agtggggatg	gtattacggc	aatataaaaat	4080
caaaaatactt	tatgaacaaa	tcctttctcc	agatgtaaac	tgcatatata	gcacctcgt	4140
atgtgtatgt	ataattttca	ttcaaacgtg	aaacaacttt	agaattggca	ccaaacatat	4200
aaacactgat	acattagact	atctcgaaca	ccttttactg	accactttga	aaacttgctt	4260

accattataag gttcattcat agctgtgatg ttctattttt attttcaatg tgggattatc	4320
ttctgtttcc cccaggagtg atattaccaa attggtgatg ttgtttctgt gattgatgaa	4380
caagatggaa agccctacta tgctcaaatc agagggttta tccaggacca gtattgctgag	4440
aagagtgcag cactgacgtg gctcattcct accctctcta gccccagaga ccaatttgat	4500
cccgcctcct atatcatagg taagtttgac aaatggcaca ggtttttttt taacttagtt	4560
aactctccaa tattatgtaa aagagtgtgt tagtcagctt gggctgtcag gacaaaatat	4620
cacagactga tgggcttaaa caacagaaag tcactttctc acagttgtgg aggcgaagt	4680
ccaacatcaa ggtgctggca acacggattt ctggggaggc ttttcttctt gccatataga	4740
tggtcacctt cttgctgtgt cctcacatgg cctttcatgg agtgagagct ctttgggtga	4800
tcttcttata aggacacat ttctgtcaga tgaggggccc acccttatgg ttctatttaa	4860
ccttaattgc ctccctaaa gtctcatctc caagtacat cacttgggg attagggctt	4920
caacatataa atttgagggg tggcgggggg ggatgcaatt cagtccataa caaaaaagc	4980
atgagtatta ttaagtacaa aaaattaga gagctttata gaaaatatga gccattttat	5040
gtagctggag tgtgagtgtc atcagttatt ttgagttaga gcaatgtgca tctactaaga	5100
attggtatgg ataagatttt tttggagtga ccagggtta aactgtacta caagaatgta	5160
ttgtctcagga actaggttat ttaggttact tatttataca aacctattca aaaataattt	5220
aggaaagAAC tatccagtt atccatact tgcaaattct caatatgtgt gcctctgcat	5280
gtctacacatg tcatcttagg cctttatagt ataaaggctg atagttgaaa tggcagctgc	5340
gtgtgctttt ttaatttcaa agctgccaaa acagttgtga gatagactca caagaattta	5400
gtgatttaata caatttttaa agttttcaga tttttacagt tacttcagac tttttatctt	5460
tctgcagtga gcatgcatca ttacttttgc atcctgagaa caagcataag tgtgtttttg	5520
gagagaactc caggggacaa taatatacca ctgttattct cacctatatg tcaagtttga	5580
tacattacca aacaatttcta gccttctgct tataagtata tagaattttt atttacctta	5640
tctatggatc aggatctcag cagaggcagt gatgtatcag aatcaccttc gggattcttc	5700
tactgcctcc tctttctaatt ccccatgctc tgatatgcat cctgtccta cagcgaggca	5760
gcattggcatg aggtcagaac accagtcttg gagccagact gtctagggtc acagcctgcc	5820
atttaccggc catgtgactt tggcaagttt cttagtctct cttgcctcac ttctctcata	5880
tgtaaaatgg gaataataat agtgcctacc tcagaagggt gatgtgagga atgaaggat	5940
tgatacatgt aaacttagag cagtgtgggt acaaaataaa catgatgcaa gtgttcaatc	6000
actgtttttg ggagaatgcc atattcttta agccgttaaa gaagaaaaaa tgattaagaa	6060
taatttcaa gtaatgcatt ttccaaggcc taatgccagg ttgctcccag agtggctctc	6120

60ccagtgtct agaaatttta acatcttatg aaaatgat atagtgtcaa aaatgtattt 6180
 aacctttccc ttggctgcct tccagggccg gaggaagatc ttccaaggaa gatggaatac 6240
 ttggaatttg tttgtcatgc accttctgag tatttcaagt cagggtcatc accattttccc 6300
 acagttocca ccagaccaga gaagggtac atattggactc atgttgggcc tactcctgca 6360
 ataacaatta aggaatcagt tgccaacat ttgtagtcca caaattaaaa ctgggtttcc 6420
 aggcctgtgt tgggtggctca cgcctgtagc cccagctatt gcaccactgc tctccaagct 6480
 gggcaatgga gtcagattct ctttctttaa aaaccacaaa aaaactggat ttccagttct 6540
 ctaatatctt tagtaccaca agatatgtca taggtatctt taaatgaaat tcttagctgg 6600
 aaaagtgact aaaaagtttt tctcctgcta cctagtaata aacaaatcat tgtttattac 6660
 tggctactta gaaaattaaa agggataggg ccaggcacag tggcttatgc ctgtaattgc 6720
 agcactttta gaggccgagg caggcggatc acctgaggtc gggaagtgga tcgcctgagg 6780
 tggaggagtt gagaccagcc tggccaacat ggcgaacccc cgtcgtact aaaaatacaa 6840
 agattagcca ggtgtgtgtg catgtgcctg taatcccagc tatttgggag gctgaggcag 6900
 tgaatcgcc taaaccaggg aggtggaggt tgtagtggc caagattgca ccgctgtgct 6960
 ctagcctggg caacagagtg agactcttgc tctggaaaaa aaaaaaaaaa aaaaaggctg 7020
 ggcacagtgg ctacgcctt taatcccagc actttgggag gctgaggcag atggatcgcc 7080
 tggaggtggg agtctgagac cagcctggcc agcatggtga aacctgtct ctactaaaaa 7140
 taccaaaaatt agccagggtg ggtggcgcac acctgtagtc ccagctactc gggaggctga 7200
 ggcaggagaa ttggttgaac ccaggaggcg gaggttgag tggagagaga tcgtgccact 7260
 gcactccagc ctgggtggag agagcaagac tccgtctcaa agaaacaaa aaaaaattaa 7320
 aagggataga atataatgaa atatattttg aacttaaatt atattctata tgtgtatctt 7380
 cctaggcaaa agctgtaatt tccagagaga ccattaggaa caggtagtat ctatttttct 7440
 ccattattta tttctagaaa ctcataaaat ggattgtatt tttctataag aacaaatat 7500
 taattaaggt atagtgact gaccaagggc ttaatcaaat aaatgacta acagcatcta 7560
 tcataaagcc acacaagcct tatgttctca tctcaaaaat gctgtgacag ctttttggt 7620
 gctttaacca taagaaaaat gattgttgga tgattttatt agcccaggct tttaaaaact 7680
 ttcattctagg ccacgtgcgg tggctcatgc ctgtaatccc ggcactttgg gaggcctgag 7740
 tggatggatc acttgaggtc aggagttcag gaccagcctg gccaacatga tgaacctgt 7800
 tctctactaa atatacaaaa attagtggg tgttatgggt catgcctgta atcccageta 7860
 ctccggaggc tgaggcagga gaattgcttg aactcgggag gtggagattg cagtaagccg 7920
 agatcgtgcc actgcactcc agcctgggtg atagagcaag actgtctcaa aaaagaaaaa 7980

aaagaaaaa	ttttaattta	atccttctgt	agaaacaggc	attcagaacc	attccattga	8040
tcttaataaa	gctgctcttt	actgtttcta	gtcaaaaatg	agacttcgat	caaaccataa	8100
gattttatac	tcgagatagt	cagcttcacc	aaagccgcag	aggaaacatg	tcgagatcag	8160
gcttctgct	tgatagtctc	ttgactacca	ttaaaacgaa	tattgggagg	tcatgaaagt	8220
oattggtagg	ccattagcat	tgatatcttt	aaaacatcta	ccctaaacca	tctgctatgg	8280
acccataata	agaggccctg	tgtatatgaa	attgtctaga	attcagggtc	aggctctttg	8340
cggttaagta	agggagcaac	acgtaaaatg	ggagaggagt	gggggtgtact	cacttgccctc	8400
ctcttttgtc	ctgattttaac	cagcattttt	caaccctggg	aaaattttgca	gaatctaagt	8460
tgatttgta	gattttgagc	tcgagcagct	ttaactctta	ccctttttcc	acatagttat	8520
ggtgtttgag	ttggaaagaa	acaactatag	gtagctacac	gtacataatt	atctctttat	8580
tcacaaaggg	tatagtaaaa	ttgattgtaa	ataactttct	aagtgccaat	attcaaaact	8640
tttggattaa	aatgtatttt	tcaccgtgca	tttactttgg	atgtatttat	ttcattttaa	8700
caattttaa	ggggctcttt	aaccaaaaat	ggtattttaa	accaaaacag	tatcgtaact	8760
agaatttga	gtagaggccg	ggcacagtgg	ctcacgcctg	taatcccagc	actttggaag	8820
gtgaggcag	goggatcacc	tgaggtcagg	agttcgagac	cagcctggtc	aacatgaaac	8880
ccgtctcta	ctaaaaatac	aaaaattagc	tgggcgtggt	ggcgtgcgcc	tataatccca	8940
gtagtctac	togggaggct	gaggcaggag	aatcgctgga	actcaggagg	cagagactgc	9000
gtgagccga	gatcgcccca	ctgcaactca	gtctgggtga	cggcatgact	ccatctccaa	9060
aaaaaaaaa	aaaagatttt	ggagtagatt	catcattaat	aagtaacaga	ttttaggaaa	9120
ttcaaaaaat	ggctaataaa	atgaacacaa	tgtaaaaaat	ttattaaaaa	gtagactttt	9180
aaaaatctat	aaattgatca	tctgtttata	aattggcaga	tggttgtgta	ccatctttta	9240
aaataaagat	tgaatttcac	ccagtgtgat	ggttcccatt	gcttatattt	ctcctgctga	9300
ggccggacct	gatattggcc	tggtctgtgt	tcccagcctt	gtttcctcat	taccactaaa	9360
atctttcccc	tgatgcccgc	cccaattttt	ctggctctga	gtcctgtgtc	atactgttct	9420
ctccaattct	acottccaaa	ggcctttctt	aacaccttcg	gattctttct	ttgagaactt	9480
tccagattcc	catgcctttt	tggaatcaat	ctctatccta	ttgtcatcac	atttaagttt	9540
ctaectccat	catcctcact	cctatccctt	tggtcctggg	atgacagggg	tgctgtgttt	9600
tatttaacta	tctttgtaac	ttccacataa	cctaaccocg	gttctgtctt	atgggagatg	9660
ctgattgtag	ggtctgagtt	agatactgtt	aaactaaaatg	cttgttgata	ttttagttat	9720
taattcatat	taactttggc	tgaacttttt	aaattctatt	gtgaatagtc	aagtaaaaat	9780
tagattgtta	cattctgggt	tagtattaga	tgttttttaa	gattgtttta	aacaagatgt	9840

ttttaagatg agttttaaat agtttcttta acacaaataa agcttaatat gagtatttga 9900
 aggaaattat cccaaaccat tccagttcct ggctgtgaaa ggcttttcca ggcctaataa 9960
 gttttccact tcagccgtaa gtagggtgaaa tcaaataaac aatagaggga aatgtattta 10020
 tttgctttat acacatgcat gtgtgttgtg tctacatata aacattgcac acgcttagaa 10080
 tgaagtttct gtcatgccca gaaaaggag aggcattttt gtggattttg tctggctgcc 10140
 ctgggggatgt ttgaagaact gtgctgttta cttcatacca ggtgtgtgag ccataccttt 10200
 ggtaggagggt tatacctcct acaccaaga aatataagcc aggagaaggt ctgtgccaa 10260
 agaaggaaac caaatgaccc acaagagggt ggocattaat tattgggtca gatgcataaa 10320
 tgcacagtaa tttatttaa cactctctaa tggtgacca caaggaagat tgctcgtagt 10380
 agcggaaaag ttcacaataa ataagagaaa aaagcagaat gtagaactgt atgatatcaa 10440
 tctcgcaaac aagaagcatc ttttataaaa gatggaagga gcccaggcac agtagctcat 10500
 gactgttaac ccagcacttt aagaggctga ggtggaggat cacttgagct gcagtgaccc 10560
 atgattgtgc caccactcca gcctgggtga tagaagttag accttctctc aaaaaaaaaa 10620
 aaaaaaaaaa aaagacggaa attcctccag aattttaaca tgtaacaga ggttttctgc 10680
 gctactttt ttcagcttta tacttcgcag tattttccaa attttctcta acaagcagta 10740
 ttttccaaat tttttacaat aagcacacac acacacacac gttgtttgc ataagtgcc 10800
 gctgggtgt gaacaaccgc tggcttttag tctatacata tctagaatat tttataaata 10860
 gtatgttcta aacccttgaa agggagtga tgaccagctg agaaaaataa gtcagtgtat 10920
 gctattttt cctatatca catcatgatt ctaggaaaaga acttgggagt gacttccttc 10980
 gcttcagcc actcctgggc caggcgcatg cttagctctg tggtaaaggt caccagcttc 11040
 ttctgcaggg tgctgttatc atctgaattg gaggtttggc gagggaaga gactgatgta 11100
 ggttcaagtt tttcttctct gtctccact tgaatctgt ctcccttcc agactcctg 11160
 cgctgctgac ttaaggcccc aacaccaaac acagaagcaa cagccttaca cagagtgttc 11220
 agcaagctcc aacaattgtg taaggtaaag tttcctttat agattccttt tctatatcgc 11280
 tcctagtgtg tctgtttctc tgatcgaatt ctggctgata acagttgctg agactctgaa 11340
 agagaaggca aggaactact gtttctcatt ataaactgtt tagaattatt tggccatctt 11400
 tttgctatga atatgtagtg ctttgataca ttttttaaat caaaaagtaa tgaaagagat 11460
 cacataggga aagatagatt ggattattt taaagtttat atactaaatt gaaaagcaaa 11520
 gaataaaaat ggagaaacag ctccctcatg tggctgttgg caggaagctt ccattcctct 11580
 ctgtgggcct ccacaggttt gctcacagca aatggtccgt gacagaaaga cgcaagggca 11640
 gttgcaccca agatggaagc caccatcttt tctataacct aatctgaaa aggggacata 11700

ccagcacttc tgccatatgc tgttgggtca cacagaccaa ctctggtaca gtgtgaacac 11760
 aggaccacac aaggcggtga attccaaggg cagagaccac tagggaccac ctccagaggca 11820
 cagaggggaca cccatccagc ctgggtggcca atgtaaatta acatagcttt ttagaatagc 11880
 aatatgtatc tataatctta aaagtattaa agtacttct tgatccagta atttcatttc 11940
 taagaatcca tgctaagagg atttaaaatg tggaccacaaa aatgggtata aaaagaagtt 12000
 gttaacagta tttaaagttg tgaaaaacca gaaacaatct aaagggtcca caataggaaa 12060
 atgaattttg atattttttc aatagaattt tatgctgtca tcagaaatcc catttacaaa 12120
 taatttttaa taaccgaaaa aaaagtttat aaaatgttta gtgtaaaacc tggacacaa 12180
 tacataatga ttctgatatt gtaaaaaaaa aaaacaaaaa cacacacata tacacatgca 12240
 tacatatgca tataaagaaa actggaacaa acaaaataac aagcatagtt ggaattacag 12300
 tcattttaat attctttatg cttttaaaaa ttttgaagtt tgtattacta gcatccacta 12360
 ctacgtagt caggaaaaaa atacaacttt aaaatagata tttagggtcca aagatggtaa 12420
 tctaaatggt gttacaggct gaatgtgtgc ctgatcccca tgccccagt tcatatgtta 12480
 aagccctggc cccaaggaca atggtattag gggagtaggg cctttgggag gtaatcagat 12540
 tctacgagg tcatgaggtg ggagcccgca tagtggaatt agtgtccttt taggaagagg 12600
 gaacagacc aaagccttcc tttctctcct cactatgtaa gaagacagcc agaaggtggc 12660
 ccagccagg aagagagctc tcaccagaac ccaaactcgc tagcaccttg ctcttgggtt 12720
 tcagcatcc agaactgtga gaaatgaatg tgtgtgtgtt aaaccactca ggctacggta 12780
 ttgtgtgca cgagcccaag ctgacagaga tagaaacaac acaaggaccc atcagcagac 12840
 gaattggatga tcaaaacgtg gtgaggtcgt gcagtgggat attattcagc cgtagaagga 12900
 atgaaattct gatacatgct ataattatga accttgaaaa catgttaatg gaaataagcc 12960
 aaacttaaaa ggacaaatat tgtataatcc cacttatatg agttagttac ctagaatagg 13020
 caaattatgt catagatata gaacattaga ggttaccagg gttgtgggaa gagggggtatt 13080
 gtgggtacaa attttcgggt tggagtgttt ttgaaaaaat tctggaaatg ggtagtgaca 13140
 gtagtcaaca tgatgaatgt acttaatgac actaaattgt acacttaaaa atgggttaata 13200
 ctgggctggc gcagtggctc atggctgtta atcccagaac tttgggaggc caagacaggc 13260
 ggatcatgag gtcaggagat tgagaccatt ctggctaaca tggtgaaacc ctgtctctac 13320
 taaaaataaa aaacaaataa aaaaaaaat agccgggcat ggtggcagcg acctgtagtc 13380
 ccagctactc gggaggctga ggcaggagaa tgggtgtgacc tgggagtcgg agcttgacgt 13440
 gagctgagat cgcgccactg cactccagcc tgggcaacag agccagatcc cgtctcaaaa 13500
 aaaaaaaaaa aaaggttgat acctgggtgc ggtggtcat gcctgtaatt tcagcacttt 13560

gggaggccaa ggcaggcaga tcagttgagg tcaagagtta aggaccagcc tggccaacgt 13620
 ggcgaaaccc catctctatt aaaatacaaa aaattagtcg agtgtgggtg tgggtgctcg 13680
 tagtcccagc tgctggggagg atgaggccta ggaattgctt gaaccacgga ggcagaggtt 13740
 gcagtgagtt gagattgcgc cactgcactc cagcctgggg gacagagcga gacttagtct 13800
 caaaaaaaag gttaaaaatt taagttttgt tatgcataatt ttaccataat ctttaaaaaa 13860
 tagatatata ggagataaa gcaacagaat ttaataacca gttgtaaata gagactgagt 13920
 gagggaggtg aattaaggaa gacattgagt acaacttttt ggtagggtgaa aaactcttaa 13980
 aaaaaatcgt gggcaaaagt cctacttgat tcttataatt taaaaatctc ccagtttagta 14040
 aacaaggcta ggtggagatt tgcattgtgat gtgagggtgt tgttctgttt tgtaattgta 14100
 ggactgtgag ccatctcctg gacttgaata tccattagat aattgaaaaa acggatttga 14160
 gaactcagga gacgtgcaat gcagtaacaa aactctgcac ctagtgtatt tctgtctcct 14220
 aatttaatgc ttttatggga caaactgtta ggcaggtggg caagatggac agccatattt 14280
 ttgtgggttt ctggcctgtg ggcagccctc agtgcctcact ctgagggtcat gtccaaactt 14340
 ggaacacatt caggccctacc acagtcaagg ctccctttct caactctagt cctctgcaca 14400
 tatatccgaa gctagaaaat aataatcctc tgtccttgtg tcttgcatga tgaaagccta 14460
 gaaaagggcc ttgggaatta agaagaatgg aaaaactggt ctaactgctg catgtctcag 14520
 ttgcagggg aatcactgaa atggggacag gccataaaag gacaaccaga agagtggctt 14580
 gagcaaaagg atcgtttttc agagcaagct agagaatcct gccagcgtcc tcaggcaggg 14640
 ccctgggca cagaggttag gcaagggtgt gtccagcat gttgatgcc ctgagcatcag 14700
 aataatgcc tagaggagct tccaaagagt tcatttcagg ttttgtaagc cgaacatttc 14760
 taggcaataa aaatttgatt ttgtgaataa agcttgtttc ttcaactcca gtgcagattc 14820
 tcatagattg atagtggctt gtgatccaga taaagaaac aatttttcaa agattcatat 14880
 tctttgtaga tgtacggatt tagagaccat ctaatctaac tccctcattc tacagatagg 14940
 aaaaatgagg cctaagaag ttaagaaaat accatggaaa tgtcactgct gaactgccat 15000
 acgtaggatc cgaaagaaat tgggtaaatg ctactgtgag aaatacagta ctaggttcaa 15060
 agaactaat acaaatataa aatctaaatg ttattttctaa agcatccctg cacatggctg 15120
 aacttacata gtttcatttt ctttcttttc tgttgaagaa gaggcaattg gctgggtgca 15180
 gtggctcatg cctgtaatcc tggcactttg agaggccgag gcgggtggat cacctgaggt 15240
 caggagttag agaccagcct ggccaacatg gtgaaacccc atctctacta aaaatacaaa 15300
 aattagctgg ctgtgtgtgc cgctgcctgt aatcccagct actccagagg ctgaggcagg 15360
 agaattactt gaactctgga ggtggaggtt gcagttagcc aagatcacgc cattgcactc 15420

*tagcctggat gacaagagg aaactccatc tcaaaaaaaa aaagaaaaaa agcaatcact	15480
aacctgtgtt gtttatataa catgacagac tggcatgaag taattacca actgtaaaca	15540
aaaaagctac aatctgccag gcatgtgtgc tcatgcctgt aatccccac cttgggagggc	15600
caggttgggg gatcacctga ggcctggagt tcaagactag cctggctaac atggtgaaac	15660
ctcgtctcta ctaaaaatac aaaaattagc ccggcgtggg ggcacatccc tgtaatccca	15720
gttactcagg aggctgaggg aggagaaatca cttgaacctg ggcagtgagg aggttgacgt	15780
gagccaagat cgcaccgttg tactccagtc tgggcccaga gagtgaagact cggctctaaa	15840
aaaaagaaaa aagaaaagct acaaccttaa tctcaacttc tcataacatc atctctactt	15900
ctgattagaa gagtggaaagt ggggagggtt attacaaaaa gactgttata cttacacac	15960
ttctcccat gaatagtga ggtgtgagt aaaaagacag caattttatt tttttttga	16020
aacaggttct tgcactgtca cccgggctgg agtgactgt tgtgatcact gtcactgca	16080
gactccacct cccaggctca agtgatcttc ctacctcagc ctctgagta gctgggacca	16140
cagttgtgca ctaccatgcc cagctatatt tttttaagag atggggtctc actatattgc	16200
ctaggctagt tctcaaaact ctggcctcaa gcactctcc gaccttgagg tcccaagggg	16260
ctgtgattac aggcataagc caccacacc agccagcagt tttagaataa aggggtgaagg	16320
ctgtgtggg gaaatataat ttaaaaaa aaatctctc tcaaccaga aatctctcc	16380
ctgaaggcag tagagaaaga taagctttat tattgaataa aaattaaatg agaatgtgat	16440
gcacatcaca ggcactttgc taagagatca caaagacaga aggaaatttc accattttgt	16500
gagccaagc aggtacagcc cattacatgt atgttttga gataaatagt cctcaactaa	16560
gagaacttga cagcaccact ggtcacacag ttcattctaa ctttacctga taattgatgt	16620
gaccacttgt gttattctaa atatcaactt ttcgggggtg ggggagtgtg gaaacaggag	16680
ttacttttat agcttgggtc aaggtactca ttaagattag gctgttacct tcccacagaa	16740
actggaagat aggtatgcta tctggtaatg ttacatttc ccagatcctt gagaagaca	16800
ttcctaggtc ataaagctga caaaaggctg attcagtttt taaatatata tatctgtata	16860
tgtatttca	16869

<210> 65 <211> 15000 <212> DNA <213> Homo sapiens <400> 65	60
gatctcttga tcccaggagg tcaaggctgc aatgagctaa gatcaagcca ctgcattcca	
gctgagtgta tagtgggaga ccttgtcttt aaaacacaca cacacacaca cacacacagc	120
agggcctttg accactcttg agtagaagac tcgagaagaa caaagttagaa ggccagagaa	180
gaacaaagtt acttgaaaga tctcttatta aagagaatgt acaagctatg aaaaaaaaaa	240
aacacacaca cacacacaaa cctcatctgg aatgaaaaaa acataatgca ttgtgtttct	300

ggttccttag gctgttatgg aacaacacaaa gaacattatt ttggtttctg aggtcagaac	360
tatttttatt ccctcaagca cactatgctt atgggtttgag ggagaatgag aaataggaaa	420
ctaggaacag gctgaaatgg tctaattctg accatctaatt tctgcagtgt cttattctca	480
ttctaaaaga gaatgggtat attcgctgtt ctagcataaa aagtaatgat aaaaaataaa	540
gatcccgat taccagacaa taatccocta gactgtttta atgcttggtt gagtatttgc	600
ttatgatctc agactttaaa agatggctct cccctatggt gaagcttggt aattatgtag	660
gcacatttaa tgtctgttta cttatcaaaa ttttatcatt gttagtgtga ttactacttg	720
acagtcacat ttatttaatt gaaaagattg gttaacattt tatagtcaaa gtaattgttt	780
cctgtgtttt ttctctgtta ggttattgga gtgatgagta aagaatacat accaaagggc	840
acacgttttg gacccttaatt aggtgaaatc tacaccaatg acacagttcc taagaacgcc	900
aacaggaaat atttttggag ggtaagtaag ggaaatttct tcagacccat taaatgttag	960
gaaaaaatgg agctaaaaga gctgggtggc tcacctttct catcctgtgc tgagaaatgc	1020
tgggggtcac ccataagtat ccagcatccc catggacaca gggaattctg aacaaatgtg	1080
atgaaaccga tgaaatgtct ggcctgttagg tggttagtga tgagatagc ggctatatgt	1140
gaatcttgat ttttgcaatt cattagagct ttgtaatgaa aggaacacgt ttgttgcttg	1200
ctttaaggat aggttcattt gcatttctcc gcaagggaagt agtaatgagt taccagcct	1260
agatttcac ccttttttga tttcttgctg acttaacttt aattgaatgg aagagttatc	1320
acaaatgaat tatctttttg gttttttttt ttttgagatg gagtctcact ctgtcaccag	1380
gttgagtgac aatggcatga tctcggtcca ctgcaacctc cgcctcccag gttcaagcaa	1440
ttgtcctgcc tcagcctccc gtagtagctg gactaagggt gcgccacca tgcccagtta	1500
atttttgtat ttttagtaga gacgggggtc cactatgttg gccatgatgg tctcgatctc	1560
tggaacctgt gatccgccca ccttggcctc ccaaagtgtc ggaattacag gcaagagcca	1620
ccgcgccag ccaggaatga caaatgaatt accttataag taaatgccat taaggaagga	1680
tagctggaag atgggttgag gggaaatggg gaccacagaa ctagtccat ttaatacat	1740
gtgcagtgtt aaatgattcc atttgacaat aggttaatta tctcatagca taaggaaaat	1800
gcttaacagt catatgcaag atgataagct ttctatagc atccaaccaa aagatctagc	1860
cagtacaatt tcttttgcta tattagggtt agaaaggccc ccagaggtga accaattaga	1920
tggaatcctt gaataaaaaca ctggatttag agtgaacaga aaaaagtcag attgctttcc	1980
ttcttcccat agatgtctca gggatattta gtttctcag aagataaaga atttagtaag	2040
cgtttttttg tgcatactta catgaaatgt acattatttg aattctttaa aaagaacag	2100
ctgcagtata acaaaaaattg tgttatgctt gcttttagctg gtatttttgc ctagaacgat	2160

tatatcggttc	ggacaagaag	ctattccctaa	gaaacaatat	ttttaaatcca	ggaagttttt	2220
cattttttaga	aattttatctt	actattttccc	aagcaaaaaga	gggtagttac	agattcacta	2280
agaatcatgt	gctcacaatt	tttattttaat	aattatttcct	ccttaaaata	tattaatcac	2340
ctgactttaca	atggtggaac	catgagtgca	tttttgcctt	tattgtcaat	aacgtotctt	2400
cagaagttag	ccacaaaggt	gcatagttct	tggagttaaa	ggtctgaatt	aagacaatcc	2460
agcataagtc	tcattaatgt	gtgattattt	tgagaaaagg	caagaagtac	ctaagaatct	2520
ccccctcact	gtccagttcc	ctgtttcatt	taaagattca	ctgtaagtaa	ctgaaaggct	2580
ttcctttggga	ggattttattt	gaatcagttc	ttcacatgca	aaggatattg	tagaacatct	2640
cgtttttgct	ggcaggaata	tgaacatctg	ttgtgaggaa	agaaaaagtt	tcatgc aaat	2700
tacactgcca	aagaagggat	gttcaagttg	agaaaccagt	gacattttct	gtaactgtac	2760
tatgaatcag	cgcatttttaa	tcttctagat	aatatatgga	agtgcaggaa	ggtggtagga	2820
acgggtgttc	attttacata	tgcgttattt	tattctgtgt	gagtgaactc	atggcaccca	2880
catgtcgtgt	tttaaatgag	gatacagtaa	attgcagttc	gaggaaggct	aactggaatc	2940
aacatacccg	tagcttttaga	aagcagtttc	cgcaccagcg	aagagtacaa	gagcgatgga	3000
accccatggt	cctggaagtt	tgcacatcag	agtaaacaaa	cttgaatacc	cctcttgata	3060
gcagaattca	ccagccttg	ttccattttc	tcttaacaaa	acacaccgca	aaagctctca	3120
gaagctgctt	tgatgaagcc	acatgtattt	cccccttcac	aatttacagg	aagttaactct	3180
taaaagaaag	tgattctggt	gtttaccgcc	tgtgttaaag	ggacagagtt	cctttttatt	3240
cttgataacg	tttgagcgaa	atacagaaac	tatctgtaga	ctagcatagt	cggtacgtga	3300
gtaaggaaaa	gcaataacct	gctgtccggt	gagcacaaaa	ttcctgctac	gaacagtgcc	3360
ttactgtctc	ttggagactg	caagtcgcag	atcacactag	gtattgactg	attgtataag	3420
gaaatttctt	aaagtctaaa	gtaaagggtg	tacctcctaa	aaagagggga	agagagaaaa	3480
ctttgtgtgg	aaggataaag	agtgtgttta	tagtttcagt	aagagtgtac	gttttaattt	3540
ttcttcttcc	tctgcctctt	tgccaagtag	cctgagtgca	tctgttatcc	agaagtagta	3600
ttactctag	acaaacttca	aattcttcat	tctgcgttgc	ctttaaggaa	caacatactt	3660
tcttcctggt	ctttttccaa	aaacacacgc	ctatggctct	gtgtgtggtg	ttttagccag	3720
cctcctccca	gataaggggt	tcccttccct	cctttgcatt	gaaaggaaa	tgcaagtcgt	3780
gacatgttta	tcaagaggaa	aagtgaactc	tcagtaatat	actgtcaaat	tcgggctgct	3840
gcccgagtgt	tcgtttgtt	atggcaggtg	aagttcacct	ttgccccacc	cagtgtttcc	3900
acaaaaaggc	aaggttccaa	gtattcatat	gaacaagtgt	tactttagga	cttgaggagg	3960
tgggggtgga	ggatgtttgc	atagttgaag	ccttggggcg	gggtgtagga	aacggcgagt	4020

acagagggcca tagaaaaagc taagactcag tttagactcg tcagcgggtc tggctcttcta 4080
 cccagtgcact caaagcacta aaagtgcagc taatcggaac tgaagtgcagt agcatcgccc 4140
 atttgccatt cactgcagta gcaaaagtag tactctgtgg tgggttaate gggttgaggc 4200
 agctccttaa atgaacattt gtgtttcatt ttctgttat ttccccgaac atgaaaagac 4260
 gataaaactg aaatggaaaa ggtaactgac aaaagtgtgc cttacctgtt tccgcccctga 4320
 ttctgtctga ttcaagacta ttctggctaa actgattgga ttctttttct aactaggcag 4380
 taggggatca gaaatcacac acggtaccgg ctgtgtttat tctgagaggt gctggggagc 4440
 ttgggtctcg acttcccttt acatgcctgt cttctctttt ggacagatct attccagagg 4500
 ggagcttcac cacttcattg acggtcttaa tgaagagaaa agcaactgga tgcgctatgt 4560
 gaatccagca cactctcccc gggagcaaaa cctgggtcgc tgtcagaacg ggatgaacat 4620
 ctactcttac accattaagc ccattccctgc caaccaggaa cttcttgtgt ggtattgtcg 4680
 ggaactttgc gaaaggcttc actaccctta tcccgagagc ctgacaatga tgaatctcag 4740
 taagtggatt acagaacaaa aaaataaaaa atgccagtaa tgcggtctct gcccttttga 4800
 actaataaca tgttgtttaa ttatacggct ttgtcatgtg ttggatgaag taggtggctt 4860
 tagctaggga ctagggaagag gaaaaacatt tttagtgctc ctattaacta ttaggaaact 4920
 ttagtcattta aaagtatata tatatatgag gagctacctt gagttttgaa ttcaggatgt 4980
 tacaggaaga aatatatgtc caattctaatt ttatccaaaa gcagttggga gaattacagg 5040
 gatttggtcca gacatgctgc gtatgcaagg tatagccctc atctgtggtc ctttggcagg 5100
 gatttagactg catcaaaaata ttatagatg tacatttgag tgtacagtta ggatctgatg 5160
 tgggaacattg taagatcatt gctagaaaaa ctttgtcata atttttcaat attattctaa 5220
 gtgaataacc gtaaaagattt tacatcttag cttccttctt tacagtaaaa aaactatctg 5280
 atctcttgat cagtattata gtagccacct atcactttat cttacaacaa totcaattcc 5340
 ttaggtttat gtgcttttac ttcttttatt tgattaaaaa tgcgtgcatg acctctctct 5400
 gcagaggggt gcatcatttt ggtcattctc aagtgatctc tttagcaaat ttaagaattg 5460
 ccataagatt ctaacctctg ctgtaactat ggttgtgtgt tcttggttag accactaaat 5520
 cttattagca gttttaaaaa ttattccttt tggtttagaa gtaagacta aatgctgaag 5580
 tttttgtaac ttttggtttt gatatacttt caaacttaag aaaacatttg aagaaaagga 5640
 caaagaattt ccacttaccc ttaccaccgg ttaccagtt attgataagt atatccattt 5700
 gctttaccag aaggetaact tgttttagtt ctcatcttca cctttgagac atttgggaata 5760
 aatatcaatg ttaacataaa ttggaatttt gactttgatt ttaggacca tgaacaagcc 5820
 aagtacttac cctagtcata tataatccaa ctgtatgggt atttggtatt cattccacac 5880

ttcatctttac	ttgatctccc	ttgaagattgc	aagatttgtgt	ttgcagtttt	tctgaaaaac	5940
tggggctata	aaagcatcag	gacctcccc	gtaggggagg	togtgtgttt	ggggctctta	6000
cacaacaggt	taccttgag	cttcaggaaa	agaactggct	ctcagttccc	cagttccacg	6060
ttaatgggtc	taattagggtc	ctgacaaaa	aggtggcagt	tcttttccct	catgtctctt	6120
cagcgctccc	cgagactctg	gagactctgt	catatcccta	gggctgagcc	tcccaggaaac	6180
cattcggtcg	tgtgtggcatc	tgtgtatgcc	atgccacgtg	ctgaggacct	agtaaaaaac	6240
gacaaatgca	caggcacagt	ggcatttttg	tggaaactcg	attccagctg	tgcgtctcag	6300
aagaagcgca	cagctccctc	ctggctttct	taacatagtg	agccacttcc	acttaagggt	6360
ctccttacat	tccttgagtt	taatcattca	tggattcaga	ggaaagtctt	ttgatttttg	6420
cttttcttta	aacagttcat	ttgaggtgac	ctaccccagt	gactttgcac	caaccaccaa	6480
gaaacttttt	tgcattgcttc	ccgcacctcg	tgccaatcaa	gggaagggtt	taaaggcctg	6540
gggtttttat	tcctcaaaga	aagggttttg	acagtatttt	aagggttcaag	tgcttctact	6600
tggtgttcag	aagcaactgt	catatatact	gtgaaatgac	accttttatt	tatccctttt	6660
tatttatgca	gtatgtcccc	ttttattttg	gcagaatttt	ttctaaatgg	tggtttaaca	6720
ttttcaagca	catttcattg	tccaatatc	atagtaaaga	atgagagtta	acaataacca	6780
gtcacattaa	aacaagattc	ctgctgocag	ttgtgaaacc	ggttgtctta	ggcgtggcag	6840
ctgatgatg	agactgtgat	caggaaaatt	tccactattt	catcaggcct	aataggtaga	6900
ttgtgtctcc	aaatgaactg	tgttgggttt	ccatgcttaa	agcacaaatg	aggtgggtgca	6960
aaatctcca	tgagggtcta	aatggcagtg	atgggttcagg	cggtagagtt	tggagaagaa	7020
gggatttgaa	acaaacaaaa	ggaaagaaaa	gtaagtagcc	agaaatcaca	aaatggcatt	7080
ttctaaaaa	caaaggaaaa	ggaataaaag	aactaataag	tttgaacccc	ctacccctcc	7140
caaatttggc	agggggggag	gtattttttt	tctatctatc	taactaaccc	atctagaaaa	7200
cagttgacca	aattatagac	ttctaaatgt	taatctgctt	tctcagtttc	agttgaaaag	7260
agactttgtt	ttgctactg	cagaacttct	aggttcttct	ttatagtctt	ggggttctta	7320
ttatagatcg	aaaatgtgag	tcggcataat	taagccattc	ggagtcttca	gaagcagttc	7380
actcttgaaa	tgactcogtc	cgccctacag	catttaagat	ttcagaacaa	aaacagatct	7440
tgattttctt	tttcatgtta	actcaagctg	ttgctgagtg	ggagagtcag	aaatgacacc	7500
agctccactg	attactcagc	tgctgaagga	tgatttttta	aaatgcacct	ttactgtata	7560
tggacttctc	aatttccacc	tgtagagcat	cttagggagg	ctaactgtgc	actctggatg	7620
ttcttttaga	ataagatgca	aatctatttt	tctgaaggca	ttagagatag	caaacattta	7680
ttgtgagttt	actatatact	aggcactgtg	ctaagtgttt	tgcatagaaa	gtttaaaaatt	7740

ctggcctttt	tgttgGCCa	atcataagt	tcatatcagt	tcaacattca	aattatatta	7800
aggtaactta	gaagaatccc	tggctaagt	tgaggggag	tgccacagat	ggactgaac	7860
tttatgctta	ttgacattt	atgctattat	tatttgtga	attatagaac	caaggagatg	7920
tggaaGCCac	tggaaaaaat	atgagactta	gatacataat	ttgagtaaaa	atggctcaaa	7980
gtcatgagg	taaagtttt	tgtatttcca	ttttattcga	gcggcatcgt	ttttaaaaa	8040
cattatgaat	ttgacccat	atagatgttt	ccaaataatt	ctttttcacc	ttcataaaat	8100
tccttcctgt	ggctgtgaga	tgccctgcct	atcagtttcc	aagcttagtt	gtctttctca	8160
tcctttacca	tttttagctt	aaaaaacaaa	agtgacaatt	agaacttcct	gcctgctggg	8220
cctcactgaa	agaccgatat	tggcctgata	aggagatatt	tattttgttt	tagtgcttcc	8280
agaaatccct	ctccctcagc	aagctttcca	tcacggcccc	cccgctcagca	tcctccctga	8340
tagcgttctt	ctctgtgttt	attctggggc	ttcaggctcg	cccaggagga	actgataacc	8400
gctggcagga	gataacattc	tctaaggggc	tctcaaatg	gaatcgaatc	cctcaagcca	8460
gtcagcctag	agaatacatt	taaagggttc	agttctggag	tttcacagag	ttcattttcta	8520
gacctatcag	atagcaagtg	tggagtctct	tctcaactaa	attcaagcag	agacattttt	8580
gtgacgatga	aggatatttg	cacaaaggct	tcagcatgat	cccccaaac	tgctgcctct	8640
gaaggcatct	ccacacattg	acagccaatg	ccttcagtg	gttctaggg	cagggtgcct	8700
ggtctgagtg	actgtctccc	aataatcaga	gtcacaacta	aacatcgtat	gttttacttt	8760
tggtttccag	gcaaggctga	gcagggaatt	ttcagtttcc	cctgccagca	tgggtgtttt	8820
tcctctgaagg	catcatttat	tgtgttagcga	ggagacaggg	ctggctgtgg	cagggatagt	8880
ctagaactgt	cctcattgct	gctgttcccta	aatagtatct	ttaccaagta	ataacgtgcc	8940
gtctttggga	ataagtgcct	tcctcttagc	ctgttctgtt	ttcttgggtg	cgctaagtaa	9000
ttgaactggc	tcaggaagta	cctattgtgg	tttggcagag	gtgactgtca	cgcttctgta	9060
ctccaggggc	cagcactgct	gggatcctgg	ctagaccaga	cagagccttg	gtgaagtgc	9120
taggctgtct	gcacatcgcg	aggaaggtgg	tattcacctc	gctaagctcc	ttggcatagg	9180
cagtttgaac	agggccttat	caaattcgta	ttcaacaaga	gtagaagcga	aaattgatga	9240
ctgtgtatta	cttgaaatga	gtcttaactc	ttcacattta	gtctcaggg	tatgtgtatt	9300
tccttttaggt	aaaccatgaa	catcagaaag	acttttatta	acctatgaca	gggtccccac	9360
cccagtatct	ttccactcca	ttaaaaatga	agtttttttt	tttttttctc	tttttgagac	9420
agagttttgc	tcttgttgcc	cagtcctggag	tgcaatggca	caatctcgcc	tcaccacaac	9480
ctccacctcc	cagattcaag	cgattcttct	gcctcagcct	cccaagtagc	tgggattaca	9540
ggtgtgcgcc	accacgcccc	gctaattttg	tatttttagt	agagatgggg	ttctccatg	9600

ttggtcaggc tgggtctcgaa cttccgacct caggtgatcc gccacacctg gcctcccaaa 9660
 gtgtctgggat tacaggcaag agccactgca tccagcttag gctatcttac tccagcctaa 9720
 acagcaattt tctatcataa ggtctgtact aatgaaaaa gaatacacca aggtctgtgt 9780
 ttgttctgtc tgtgtgccca ttgtccgcat tttgtgagg aggaacccga actgcacttt 9840
 tgagttagtg gccacagacc ttctagaatg agagtgcgtt ggaagccaga tatgtggcga 9900
 ttgtgtcgcc agctgttact caggttttct caagaaggag gagcaacttt ggaggttttg 9960
 cttcagttct ctctagccct ctgtgtaato gcccttttt ctttatttca gcacaacac 10020
 agagcagttc aaagcaaccg agcactgaga aaaatgaact ctgcccaagg aatgtcccaa 10080
 agagagagta cagcgtgaaa gaaatcctaa aattggactc caacccctcc aaaggaaagg 10140
 acctctaccg ttctaacatt tcaacccctca catcagaaaa ggacctcgat gacttttagaa 10200
 gacgtgggag ccccgaaatg cccttctacc ctccggctgt ttaccccatc cggggccctc 10260
 tggcagaaga ctttttgaaa gcttccctgg cctacgggat cgagagaccc acgtacatca 10320
 tgcgtcccc cattccatcc tccaccactc caagccctcc tgcagaagc agcccgacc 10380
 aaagcctcaa gagctccagc cctcacagca gccctgggaa tacggtgtcc cctgtgggcc 10440
 ttggctctca agagcaccgg gactcctacg cttacttgaa cgcgtcctac ggcacggaag 10500
 ttttgggtgc ctaccctggc tacgcacccc tgccccacct cccgcagctt tctatccct 10560
 ggtacaacgc tcaactcccc aagttcctct tgcccccta cgccatgaat tgtaatggcc 10620
 tgagcgtgt gagcagcatg aatggcatca acaactttgg cctcttcccg aggctgtgcc 10680
 tggctctacg caatctctcc ggtgggggca gctgcccc ccccatgctc aacccactt 10740
 tctctccgag ctogctgccc tcagatggag cccggaggtt gctccagcgg gagcatccca 10800
 gggaggtgct tgtcccgccg cccacagtg ccttctcctt tacccggggc gccgccagca 10860
 tgaaggacaa ggctgttagc cccacaagcg ggtctccacc ggccgggaaca gccgccacgg 10920
 cagaacatgt ggtgcagccc aaagctacct cagcagcgat ggagccccc agcagcgacg 10980
 aagccatgaa tctcattaaa aacaaaagaa acatgaccgg ctacaagacc ctccctacc 11040
 cgctgaagaa gcagaacggc aagatcaagt acgaatgcaa cgtttgcgcc aagactttcg 11100
 gccagctctc caatctgaag gtaggccttg agagagagca gtccaagggg ctgtgagtgc 11160
 atgttgtgt ttgtatttag cttgctttcc atggggtatc gattgcattt gcagtagtat 11220
 gagccccgg ttggggatag tgggtatgga ttccgcctgg cttttgccac ttctagctct 11280
 ttgactttgg acaagtgact tcccttctcc tgattttctt ctgaataata aaaaaattag 11340
 gggtttgac tagaagatta ggtgaaactc cctgctagcc tgtgattttt gtgcttttaa 11400
 gaaaaacacc attctgaaaa catgaagatt tcttcttttt aagactgtct tgatgctttt 11460

cttaagatat ttgcatcaac acttgagtct tggagcagaa atgttaggtc tcagagccag 11520
 cttagagaca gagctaacac atgtggcttc ttcccaggto cacctgagag tgcacagtgg 11580
 agaacgcgct ttcaaatgtc agacttgcaa caagggtctt actcagctcg cccacctgca 11640
 gaaacactac ctggtacaca cgggagaaaa gccacatgaa tggcagggtg gcagtatttt 11700
 ctgggtagac ctcttgacct ttgtagaaaa tgtctgtgag tcaacctccc atgtcctata 11760
 tagccgtag ttaaagccaa caccagatc tgcgtgtgct catcctggac tgatggcact 11820
 atggtccttc ccagtacttt gtatctgctg atgacttgag atggcacagc cagcttccag 11880
 tgggtgggaa aatggtaggg gaaataaaca gccctcgtg tgctgtgtgc ccacatcccc 11940
 cgtttgtcct aataccacac tggagggtgc acaaggaggc ttctcacctc ctagggtgct 12000
 gggcgttggc cggtaaagcct gccctccccg ttggcaactc ttaatcttct ggcttctctg 12060
 tctcccttcc ctgctgtctc tctccctcac actgtagggtc tgcacaaga gatttagcag 12120
 caccagcaat ctcaagacc accctgcgact ccattctgga gagaaacct aaccaatgca 12180
 ggtgtgcct gccaaagtca ccagtttgt gcacctgaaa ctgcacaagc gtctgcacac 12240
 cgggagcgg ccacacaagt gctccagtg ccacaagaac tacatccatc tctgtagcct 12300
 aaaggttcac ctgaaaagga actgcgctgc ggccccggcg cctgggctgc ccttggaaga 12360
 ctgaccoga atcaatgaag aaatcgagaa gtttgacatc agtgacaatg ctgaccggct 12420
 gagggacgtg gaggatgaca tcagtgtgat ctctgtagtg gagaaggaaa ttctggccgt 12480
 ggtcagaaaa gagaagaag aaactggcct gaaagtgtct ttgcaagaaa acatggggaa 12540
 tggactcttc tctcagggt gcagccttta tgagtcatca gatctacccc tcatgaagtt 12600
 gctctccagc aacctactac ctctgggtacc tgtaaagggtc aaacaagaaa cagttgaacc 12660
 aatggatcct taagattttc agaaaacact tattttgttt cttaagttat gacttggtga 12720
 gtcagggtgc ctgtaggaag tggctgtgac ataatcccag ctctgcaaag ctctctcgac 12780
 agcaaatggt ttcccctcac ctctggaatt aaagaaggaa ctccaaagtt actgaaatct 12840
 cagggcatga acaaggcaaa ggccatatat atatatatat atatattctgt atacatatta 12900
 tatatactta ttacacctg tgtctatata ttgcccctg tgtattttga atatttgtgt 12960
 ggacatgttt gcatagcctt ccattacta agactattac ctagtcataa ttattttttc 13020
 aatgataatc ctctcataatt tattatacaa ttatcatc agaaagcaat aattaaaaaa 13080
 gttacaatg actggaaaga ttcttgtaa tttagtata aatgtatttt tgtctgtgg 13140
 ccattctttg tagataattt ctgcacatct gtataagtac ctaagattta gttaaacaaa 13200
 tatatgactt cagtcaacct ctctctctaa taatggtttg aaaatgaggt ttgggttaatt 13260
 gccaatgttg gacagttgat gtgttcattc ctgggatcct atcatttgaa cagcattgta 13320

^ataacttgg gggatgtgt gcaggattac ccaagaataa ctaagtaga agaacaaga 13380
 aagggaatct tgtatatatt tgttgatagt tcatgttttt cccccagcca caattttacc 13440
 ggaagggtga caggaaggct ttaccaacct gtctctccct ccaaaagagc agaactctcc 13500
 caccgacctg cctcccccac cgagtcctgt ggccattcag agcggccaca tgacttttgc 13560
 atccattgta ttatcagaaa atgtgaagaa gaaaaaaatg ccatgtttta aaaccactgc 13620
 gaaaatttcc ccaagcata ggtggctttg tgtgtgtgcg atttgggggc ttgagctctg 13680
 gtggtgtttt gttgttggtt tttgttgctt tttttttttt ttttttttta atgtcaaaat 13740
 tgcacaaaca tgggtgctcta ccaggaagga ttccaggttag ataggctcag gccacacttt 13800
 aaaaacaac acacaaacaa caaaaaacg gtatttctagt catcttgggg taaaacggg 13860
 taatgaacat tctatcccc aacacatcaa ttgtattttt tctgtaaaaa tcagattttc 13920
 ctcatgtttt gttgtttttac attttatggt taatttaaat gaagatgaaa gggcattgca 13980
 agttgttca acaacagtta cctcattgag tgtgtccagt agtgcaggaa atgagtcttt 14040
 actaatgat ttgtctctct agaggagaaa ccgagtaaat gtgctccagc aagatagact 14100
 tgtgtgtatt ctatctttta ttctgctaag ccaaaagatt acatgttggt gttcaaatg 14160
 agcaaaaaa tgatgtatat ttataaatct atttatacca ctatatcata tgtatatata 14220
 ttataacca cttaaatgt gagccaagcc atgtaaaaga tctacttttt ctaagggcaa 14280
 aaaaaaaaa aaaaaaaaaa gaacactcct ttctgagact ttgctaataa cttggtgacc 14340
 cacaatcac gtcggtatga ttgggcaccc ttgcctactg taagagaccc taaaaccttg 14400
 tgcagtggt ggggaccaca aaacaaccag ggaggaagag atacatcatt ttttagtatt 14460
 aaggaccatc taagacagct ctattttttt tttgccactt tatgattatg tggtcacacc 14520
 caagtcacag aaataaaaaa ctgactttac cgtgcgaatt tttctgtttt cctccttact 14580
 aaatactgat acattactcc aatctatttt ataattatat ttgacatttt gttcacatca 14640
 actaatgttc acctgtagaa gagaacaaat ttccaataat ccagggaac ccaagagcct 14700
 tactggtctt ctgtaacttc caagactgac agctttttat gtatcagtgt ttgataaaca 14760
 cagtcttaaa ctgaaggtaa accaaagcat cacgttgaca ttagaccaaa tacttttgat 14820
 tcccactac tcgtttgttc tttttctcct tttgtgcttt cccatagtga gaatttttat 14880
 aaagacttct tgcctctctc accatccatc cttctctttt ctgcctotta catgtgaatg 14940
 ttgagccac aatcaacagt ggtttttatt tttctctac tcaagttaa aactgacca 15000

<210> 66 <211> 46340 <212> DNA <213> Homo sapiens <400> 66
 tattttactt cagtaacaga aaatgaaga aatgttttaa tgttgctgat tgtattacct 60
 tcaggatcaa tagcagaagg acaaaactct ttgaggagat ctctagtgt gtgcaactgt 120

ccatctgcag ccacaggacg aaacagcttc tgaatgaaag gtctttcagt cgttgtctat	180
ttgaaaaagg aaaaatgat tcaagcaatt aagtctttgt tgctgccaat tacaaattta	240
tatatcataa actttatggt ggcattaggt gccttttgat acggtgtag cataattaca	300
caacatcaca gatgtggtat cactgtgaaa aatgtttaac atgataaatt caggtaaatc	360
taattctgag gaaacagaca aatccaaagt tgggtgggac attctaaaga taattggctg	420
ggacccttca aaaacttaaa gacattaaaa agcaaacaac acaaaaagat atcaacaaaa	480
gcattttttc tcagtatctc ttaagagac taacaaaagca aatacaaaa ataaacctag	540
gctgaatact aaattgaaga aggacatttt ttagaaatcc aactatgaaa cacagttttg	600
ggataaatgg ggaataacag aatggacaac tgataatatt attgagttaa tgtcaaat	660
cttaggtaca ataaggacaa tccttatttt taagaaatcc attgttcaag tgttaggaa	720
agaagtgcc tgatatccaa aacttaatct tccttctctt tttttggaga cagagtctcg	780
ctctgccacc ccgctggag tgcagtggcg cgatctcagc tcaactgcaac ctctactttc	840
agggttaag tgatttctcat ggctcagcct cccaagtagc tgggactaca ggagtgcgcc	900
accatgtcca gctaactttt tgtattttta ctagagatgg ggtttcacca tgttgccag	960
gtgtgtctca aactcctgag ctacggcaat ctgccggctt cggcctccca gagtgttagg	1020
gttacaggcg tgagccaacc gtcctgggcc ccaaaactta accatctaatt ggttgagaga	1080
gagacagaga gagagagaaa gagagagaca gagaatgtgt gtgtgtgtga agacaaagca	1140
gaaataaaaa aatattaaact aatggtgatt ctaggtagag ggtgtatgat tttagtagtt	1200
gttatttttc aacttttcga taggtttcac aatttccaaa acagcagatc cagccatttc	1260
gtctgacaaa aactgttagc agcactacat cgtaatttat tgctaataat ctcatgtttt	1320
tactcttaaa attgtttcat ttactaaatt tccttagtga tgatggagcg tttatcatga	1380
cagagtacag aggctctgaa atgagccagt gtctatgaag agcaccactg tttgcaagat	1440
ctatgatctt gtacccagtt tccttttatct gttaattttg gacattccat atctcttgag	1500
tttgtgtgag aaataaatga gcaactttgc caaccacaga gtaataaat aaatgttaaa	1560
gagaataaaa gcattttttac ctctctctc cctcttaacg gttattttac tttaatgag	1620
taaattttaa gctttctgag atgaaaaatc attaaaactt aacaagaaca gagaaatgcc	1680
atacatcat attttttgtt tgcttgttct ctgagacaag gtttcaactc gtcacccagg	1740
ttgaattgca gtgtgccaac ccccaagttg caatcctcca cctaagcctc cagagtagct	1800
gggactacag gtgtgagcca ccatgctcag ctaatttttt tacttttttg tagaaggggg	1860
ttcactatg ttgccaggc tgcctcatat ttataagaa tatgacttca aacacttagg	1920
cattagcgac aaggttttgt ttttgtctt taatgacaga ggtatacctc aacatatttg	1980

'acacaactgt tagagatttg gtttaaaaag aaatagacat ggatgaagct ggaactatc 2040
 attctcagca aactaacaca ggaacagaaa accaaacacc tcatgttctc actcacaact 2100
 gggagctgaa caacagagaac acatggacac aggcagggga acatcacaca ccaaggcctg 2160
 tcggggagta gggggctaggg ggagggatag cattagggaga aatacctaac gtagatgagg 2220
 ggctgatggg tgcagcaaac caccatggca catgcatatc tatgtaacaa acctgcacat 2280
 tctgcacatg tattccagaa cttaaagtat aatacaaaat gaaaaataa ataaaaataa 2340
 gtagaaaaaa taaacatgta agcatgtgag ctgcttttcc taattctatg tttatgtatt 2400
 cactgaatac atagtatttt aaaatagtaa tccaataata tatttgagtg tttgtgacaa 2460
 gtatgaaaat tgtaattttt aaaaaatctt gataatatgc attgaatatg atttaattca 2520
 cttcactatt tgaactcttt agggattatt tttaaaaata tgattgatat cctttgatat 2580
 gttttggctc tgtgtttcca tccaaatctc atctcaaatt gtaatcccca ccgctctagg 2640
 gagggactgt aatcccatg tgcagagga gggaggtgat tgggtcatag ggggtggttt 2700
 cctcatgttg ttctcgtgat actgagtgaa ttctcatgag atctgatggt tttaaaagt 2760
 gcagtttttc ctgcactctc atctctcttt cctgctggct tgtgaagggt cctgcttccc 2820
 ttcttgccat gattttaagt ttctgaggc cccacacaag catacggaac tgtgagtgaa 2880
 taaaaccttt tgcctttata aattatccag tctcagatat ttcttttaag cagagtgaag 2940
 acagactaat acattcttca atttaaaaag ccatacttct tcatacaagt tgaaaccaag 3000
 tacaatatca tgcataatca agtgattaac tgtgtaaaga taataagggt gaggagtcca 3060
 tgaagaagaaa gaaatgaata gggaaactgt gtgataattt aaaatagcca tccctcactc 3120
 tggggttttg atcttcaggc catgaagaag cttttaatgc tttttagcaa aggaagtaat 3180
 gttggtgaaa ggctttttct gacgactaat ggaaagcagt gctatgtatg gtgacttggt 3240
 tatgaaccaa aaccagaatg actggtgaga ggctgactga atacagcaag cttatgtgaa 3300
 gacaactgga gctgggtgcag tggaaaagga agacagcagg actgtaccca caactcaag 3360
 aaaaaagtca gaaggtaacct cccgcagtcc aacctgaaaa caacaaagtc aaaggaatct 3420
 tttcaagaat ttggagctct cattoatctc ctaattagtg tatgaaatg gaggtggctt 3480
 tgctataatg aaattacctg gaattttctt aacacaaaga aataataaat gottgagggtg 3540
 gtgaatatcc tcatgtgac attacacatt gcatgcttat agcaaaagat tacatgtacc 3600
 ccataaaaaa ttgcaactat tatgtatcca taataattaa aactaaaaa ttaaaaaata 3660
 cctgaaaaaa aatgctaacc aggaaaaggc aactagtctt gggtacatat taaaaaacag 3720
 aaattcttct ctaacctcac tattggagaa atatcctgtt atttttatat atcttttttt 3780
 tcacccttcc ccaaatctga gcaagtatta taaaggtata accttaaca atcttttatg 3840

atgaggtatt	tgcttactcg	ggacaaagcc	ccagtgtctat	tacatagtgt	agctaaacgc	3900
tgtagaatgg	taaaaacaag	aaaatgctca	gcaaagtgtt	gtttctcatt	taatgaaat	3960
cttatttttaa	aacacaaaaa	ctcaatatac	cccaaccaaa	aatctgatga	acattttctg	4020
tttaatat	attatacagt	acctttaaaa	acgtaatat	cttattctta	aaaatttagt	4080
gtgctagcaa	atagcaatta	agtacctaag	tcaatcagga	cgacaaaaaa	atactcaatt	4140
tggggagtta	gttacttcta	tcatctgaat	gcgtccctcc	aaaattcatg	ctgaaaccta	4200
ttcctcatca	tggcagtatt	aagaggtgaa	gcctttgaga	ggtaatttag	tcatgagggc	4260
agagtctcca	agaatgggat	caatgctctt	ataaaagagg	cccaggagg	ctgtgaaggc	4320
ttttgccct	tctgccatgt	tgggggggtg	gggtgggggg	cgagcaacc	agtgctaact	4380
ctgaagcaga	gagcagccct	caccagaaac	cgaaatctgt	gaagccttga	tctctgactt	4440
cccagcctcc	agaactgtga	gaaataattt	tctgtgtgtt	ataaattacc	cagtctaggc	4500
tgggcgtggt	ggatcacctg	aggtcaggag	ttcaagacca	gcctggccaa	tatgttgaaa	4560
cccctctct	actaaaaata	cagaaaatta	gctgggcata	gttggtggcg	cctgtaatcc	4620
gagctactca	ggagcgtgag	gcaggagaat	cacttgaacc	cagaaggcag	aggttgagc	4680
gaatcaagat	catgccattg	aactccagcc	tgggcaacaa	gagggaaact	gtctcaaaaa	4740
aaaaaaaaa	aagtacacac	totaacatat	tttggtatag	cagcccaaat	ggaatggact	4800
agacaatta	cccttaaaat	aaaagctccc	atagagagat	catgcattca	agtacagagg	4860
ctctaagg	caatgggaat	ggaggacata	ttcctgcaaa	cttttcaaca	gctctcatta	4920
cccgatgtt	agagctctgc	aaagaagact	aaattatact	gagaaatatt	tttaaatctc	4980
acaaaatagg	aatgctgtaa	acgttgattt	agtatatata	aaattagaca	agactaacia	5040
tatccaatgc	aatctaaatc	ttaggttgac	agacaagaaa	gccactgcaa	acaggaatat	5100
accacaatac	ctgatcttgc	cacatatttg	taaatatgca	aagtatttca	ataacttcca	5160
agaaacagta	ttactctcat	gagaaataac	atgatgtaag	tcacctttga	aactgtcctt	5220
gttacttttt	caaatgtatg	ttagtcaatt	cttaacacca	aatgaaatga	aaaactgagg	5280
tggtaatggc	tggtgtctcc	catctctcct	ctactcatgt	gccttcacca	atacagcaat	5340
cattttttct	tatatgggaa	atttacagtg	ttgatatagc	tcagagatat	attgaagaaa	5400
agcagaaaaa	cgaaaacttat	aaacatttta	ggaaacctta	tgtattttct	taaatagttc	5460
aagtgtaaaa	cttagaatcc	ttataaataa	tgtgtgttac	agctatatgt	taaatgggtg	5520
ctcatgcctg	taatccagc	acttcaggag	accgaggtgg	gaggagagct	tgagcccatg	5580
agtttgagac	tcacccgggc	aacacagaga	gacctcatct	cttaaaaaaa	aaagaagaaa	5640
agaaagaaat	gaaatgcaaa	gaaaaagtct	ctatttcaaa	tgtagccagt	agagccaata	5700

ggtaaccaa tattaacatt aacgttgata aaacaagaaa tgatgattta ctataagctg 5760
 aaaatcagac aatgtatgga cttaagagt aacaggcagc atcatcacia acttaaatca 5820
 ggtttgagtc ctatgagtta tatacagtta catgatgcaa caaagatgc cagccagttg 5880
 ttaaagagta ttagattcgg ctgggggtgg tggctcatgc ctgtaattcc agcactttgg 5940
 gaggccgagg agggaggatc acgaggtcgg gagtccgaga ccagcctggc caatatagtg 6000
 aaacotgata tctactaaaa atacaaaaac tagtcaggca tgggtggcacg tgcctgtaat 6060
 cccagctact cgggaggctg aggcaggaga attgcttgaa cccagggggc ggagggtgca 6120
 gtgagccgaa atcgcgccac tgcactctag cctgggcaac agagcaagac tctgtctcaa 6180
 aaaagagtat tagattcaag tctgttttct gtcatttatt atggaacctat ggacacaact 6240
 acctatcttt cctgaacctc agttttttca actgcaaaac aggaatatat acatatgtgt 6300
 atatatacat ctgtgtaaac acatatgtgt atatatacat ctgtgtaaac acatatgtat 6360
 agtataaat ggagataata cctacattat agtttctgag ataataaaat gcacaacaca 6420
 attctgacac ataacaattt gtaacttaaa acataccato accaggggca ctagttttag 6480
 aacactgtaa tgcatagtct aatttaatac tatgcaaaact gtgttcaact aagggtttat 6540
 ttccttttaa tttcattcat ttactcttca gttgtttgta agctaaaaag tccagataca 6600
 tgaattcag aagtttactg tttaatgttt ttctatatgg caaggaaaaa aaaaagggca 6660
 agtcatttt aacactactt tcaaaatcag cctagaactt aacactaaag gcatgaccca 6720
 taaaagggaa tactaataaa tagacttaat taaaattaaa caacaacaac aacagctaag 6780
 tttttgttct gcaaaagatc ctgtgaagag aatgaaaaca taagccgagc gctggggagaa 6840
 tatatttgca aaccatattt ccgagaaaagg tcttgtgtct ataatatata agaactccca 6900
 aaattcaaca gtttttaaaa aaagcaaaata atccaattag aaaatgggca aaagacatga 6960
 acagacattt taccaaagag aatatatagg tggcaaaata gcatatgaaa acatatctca 7020
 cacatcatta gccattaaag aatgcaaat taaaaccaca atgtgatata attacacacc 7080
 taccaaaata tccaaaataa aaattagtgg taacacaaaa tgctggtgag catgtggaaa 7140
 aatagtcctt cacacactga tggtaacaaat gcaaaacagt acagtccttc aggaaaggag 7200
 tatggcagtt tcttacaaaa ctaaacatgc acttaccata tgaccaagta attatactct 7260
 tgaatatctc cagaagtaaa aatgtcttct ccaaaaaact tatacatgaa cgttcatagc 7320
 tgttttattc gtgagagtca aaaacagaaa gcaatcccag ggctacccat taaaacaggt 7380
 gaatgcttat aaactgactg taataggtct gtcccacgga atactactca gcaataaaaa 7440
 ggaacaaact actggtatat gcaacaactt ggatagatct caagggagtt atgttatgtg 7500
 aaaaaagtca atctcaaaag gttacacact gcatgactcc actgatataa cattagttaa 7560

atgacaaaaa	ttttagaaat	ggaaaacaaa	ttagtagttg	tcagaggtta	gggaagaaat	7620
gcagtaagg	aggtggctgt	ggctataaaa	gggtagccta	agagatccct	ctgttgaaac	7680
gggtatattt	tgaatatagg	gtgaatttac	atatgtgata	aagattgcat	agaactaaat	7740
acacacacac	agtatatgta	aaactaagga	aatctgagta	aggtttgtgt	attatattaa	7800
tacaatttcc	tggttgtgat	actgtactgt	aattatgcaa	gatgttagaa	ttgggggaaa	7860
ctagatgaag	ggtatgtaga	tctttctgta	ttatttctta	caattgcatg	tgaatctgta	7920
attatctcaa	aataaaaaat	ttttcaaaa	tttcaaaaac	actagtcctg	agctttgtta	7980
atcaaagttt	tctctgagga	cctgtagcat	tttggttata	acctggatct	tattaaaaatg	8040
tagattctca	ggctgcatat	tggaattcct	gaattggaat	ccgcatttta	acaagatttc	8100
caagtgatc	atgtttaaag	tttgagaagc	actagtctac	aacaatgact	tttaaccttt	8160
caacctactc	taacacactt	gaaggccata	acaaaattca	catcaataac	agttgtctcg	8220
aggacagtg	actctcaaca	caaagtagtg	aggaaaagg	gggactcaag	actcaggtag	8280
aggaaaaagc	cccttaggtg	atcctgatga	aatgttttct	ccatcctggc	tgaaaaaccc	8340
gaacacagtc	attaaggctc	aaaacaaaag	taatgtttat	aatactggag	atctttaaaa	8400
gcagataat	atatactata	acagagcaaa	ggtaattatt	acaatgtata	aatcttataa	8460
gaaccaaatt	cagaattaaa	atcactaagc	acataatgaa	aatcctttaa	aaagtataaa	8520
atgaatgta	gtctaagtaa	atactaataa	tggcagttat	agtgagaaaa	gctctagagt	8580
ttttactct	tcactactcc	tagtcacaaa	catctatttc	caaaactgac	ccttcgtatt	8640
caaaataatt	tatggctcgt	tacagtaata	agagcatgat	atttaaagcc	agtcagaaga	8700
acatatttct	agctctggat	ggcacttgat	gacgatggat	tcagcttatg	gttccaatcc	8760
cagctctgtc	aattagtacc	tatatgacco	tagtcaaata	cttaaaccct	cttgtgttac	8820
ttgtgtgtca	attgtatcat	ctataaaatg	aggatattaa	cagtatatac	ctcatagatt	8880
tttttgtgaa	ggttatataa	tttaattcata	taaagtattt	agaacaatgt	ctagcacagt	8940
gaattctcaa	tgagtgttat	aattgttctt	tttaaatgtg	acttgactct	caacagaact	9000
ctactgaatt	ctaatatgta	ttctgtattg	agctgtcaaa	aaaaataagg	attataataa	9060
catatactat	tottgtagtc	aacctgttta	ctatgttatt	actagtgtca	gttttgtgtg	9120
tttggtcata	catattgttt	tacatacatt	aagaattatt	agaaatgttg	gtttattaaa	9180
aatgaccatt	tatggctaga	agggtatata	tctggctcac	tgactgtgga	gtcaatgtcc	9240
ataaagagga	ggaagaatgc	catcagagta	aaaggagatt	ctattcactg	aaacaaagtg	9300
ataaaaagct	atgaaaagaga	aaaacataaa	ataaccaaag	gggtgaaact	taacagatgc	9360
ccagtagatg	cacaatgcac	tgggttgtaa	aacttaaaat	ggccttaatt	aaaagccaag	9420

*acgggatgga ggtgctgggg gagtctccta cggacacagc aggcagaatg taacaatgac 9480
 aaggggctca agttattatta aaaagagatt ggacaggccg ggcgtgggtg ctcacgcctg 9540
 taatcccagc actttgggag gctgagggcg gtggatcatg aggtcgggag ttcgaggcca 9600
 gcctggccaa catggcgaaa cctcatctct actaaaaata aaaaaaatta gccgggagtg 9660
 gtggcgtgca tctgtagtcc cagctactca ggaggctgag gcaggagaat cacttgaacc 9720
 tgggaggcaa aggttgcagt gagctgagat catgtcactg cactccagcc tgggcaacag 9780
 agtgagactg ctcaggatct cccaaagacc caaatccctg taaactgaat gcataatatc 9840
 atttgcctca gtgaggctta gatggacatt ctagtcttct tggttgagct gaagaacaa 9900
 atattatatt gataatttat gtatgttgta tttttcaagg tatagcaaca agtttttatt 9960
 catcagctac tttgtgtgtg tgctttgttt ttaagtcttt tgaacacgga tggtgattta 10020
 ctacatttat aagtaaaatt tatttgattt acaagggttg cttaagtgtg tcacaggatt 10080
 tcaacttgta tatttgcagg tgcttaaaaa atcagctata ctaactata actggaatta 10140
 gcaaaagtca tttattgatt aatcaagaat ataattagat ttgcctaact atataagtag 10200
 tactatgtgt tattaagaa ttaaatctag aaaagggatg gactctggaa atatacagaa 10260
 ttgaaaaaga ctgctctcat tttgtacaa caattactaa atttctaagt agcattaatt 10320
 caactgaaaa ggcatttttag aaaaactaga ttttacaatt tataactcta ataaacaca 10380
 ctaactatg agtgtgcttg ttcatgccca aaagctacct tccaaaatta aaacccctat 10440
 ggatggctg ggtgcagagg ctcatgcctg taattccagc actttggggg gccaaaggcg 10500
 cgggatcacc tgaggtcagg agttcgagat cagcctggcc aatatgggtg acccgtctct 10560
 caaaaaata caaaaattag ccgggcgctg tggcgggtgc ttgtaatccc agctactcgg 10620
 gaggtgagg caggagaatc acttgatcct gtgaggcgga ggttgagtg agctgacacc 10680
 gtcccactgc actccagcct gggcgagagc ccagagcgag actccgtata ttaaacaaaa 10740
 caaaacaaaa ctcaaaaac cctattggca attactaggg ccatcaaac agtatatttt 10800
 cacttgacac acaattttga gataatgaac cgaacttact atttttgaaa atattacata 10860
 ataaatatta gtgaagcttc attgctgaaa tggtgacaaa gatgaatagc aataaaactt 10920
 ttcttataga tcttttagca aaacaaaaaa accccaagca tactatggtg cattacttta 10980
 gagaatcaag tagctgctag ttgagtaata gtggtaatag gcactacaat gatataaaca 11040
 aattacaaca aagaatattg tttttatttc ctgtccatgt tttaaaaag ctttggtttt 11100
 acctatgttt aacaaaagca taggtacaac aacgactact actactaaca tataagtagc 11160
 ctggatagaa ttattottaat agtagtacc aagtgcagga tctctaagta atgatcagaa 11220
 ggcaggaata aattttatca gaaatcttca ttcattacat atttactatg catttaccag 11280

ggatcacta tgctaattgga tacaagata aataacatgc aaacaactgt aatacagtgt 11340
 tatgtgataa cagaaatatg tacaagcac tatgaaaaaa attacaaagc ttgagcacia 11400
 attttaactc tggacttact ggcatttaga gcaaaaccaa acaaatccta actggttaat 11460
 ttcattttct aagagttgga agctatatca gtaggtacaa agtaaaatat gctaattgtg 11520
 gtagaaagta aaatattaca acagtagaga atttcaaaag aagataaaaa taatggaggg 11580
 aatatagaag gtcttcaagc ttcagccttg aaatacatat ttttttttaa atagagaaaag 11640
 agataaagtc atttgagtat tcagagggca gactgaatat aatggtactt ctgagaaaatc 11700
 agtgggataag gagagaaaaag tggactaaaag gccatagcat atagagcttg gaatgtcaaa 11760
 tgtagtggaa ataacaaaag tttggttgga atcccaactc ccaacaactg actgtgtatc 11820
 tagagcaaat tacatcaacc tttgggagta ctgtttctga atctgaaaaa tgaggaaaaac 11880
 ttatctttga acaattgatg tgataattaa atgagatata tgaatatctt aatgtacaa 11940
 ggcttaaca atgactagt cttttcatc ctctcttgaa ccattgtgaa acgtagaacc 12000
 agaaaggta acagtattta gttgttacag aaccatttaa gagagaataa aaaataactg 12060
 gtatttcaac ttcagtttcc tttgaagtct tgttaattgag aataaatatt atgtggcaca 12120
 agaaaaaga aaacaggggt ttacacagga tatgctgcca gactttacca acaatgacac 12180
 atgatatctg ctccaactgt cccatgcata tttggcttaa gatataacca tgcataatca 12240
 attttacatc acatggtttt caaaaaga ttcattaaaa ttactttaag aatgtacaca 12300
 atatacaata cctcattaaa taaaaagaac agaccatttc caaatgaatg ctttttagagc 12360
 ttacagtaa acagtctttt ggtggtagaa agagggggaa cagagagggg agtgggtggg 12420
 agtctgtagc acttatcaga ctacttttat cttttatgta gagaaatagg agagtgtgaa 12480
 ataagcactt tctgtactta tgttgagagt ctgaagccca cttttaatag tcttgacaac 12540
 actaaaaaat aataattaac attgaaaag ctgtcattat tatagtcagg gacacttaat 12600
 ctccaaagga gaagtttctt aattgatact atgattaaat aaagcatcc atcagaatta 12660
 tatccacaat ctggtttgga gtttatgttt tgtcttattt aaattgttat acttattata 12720
 attctgtcta gacagtgcc aatgtacttt gtcatacaaa cacttgaggc aaattttctt 12780
 caaataagcg caacactttg tttctcttc gtatcctttg actgaataac gtgtggtaca 12840
 gagaagtaat acttcccttt cttgggacg agatcaattt gatgcttgtt ataagcccat 12900
 ttacagaaca aatggtattg cttttaaat tttatatgaa ctatcagta gactagccaa 12960
 aaaagaagct tcatataaaa gtgctaggat tgatattctt agtaataatt aggtaaaattc 13020
 tctaaaattt tctccaaaa gatctgaaa atcataccaa ggggaagtata gtttaaaattt 13080
 cattatatat aatagcttta aaatatcttt gctaattcta cccaaagcca cactaaaaag 13140

12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525
 526
 527
 528
 529
 530
 531
 532
 533
 534
 535
 536
 537
 538
 539
 540
 541
 542
 543
 544
 545
 546
 547
 548
 549
 550
 551
 552
 553
 554
 555
 556
 557
 558
 559
 560
 561
 562
 563
 564
 565
 566
 567
 568
 569
 570
 571
 572
 573
 574
 575
 576
 577
 578
 579
 580
 581
 582
 583
 584
 585
 586
 587
 588
 589
 590
 591
 592
 593
 594
 595
 596
 597
 598
 599
 600
 601
 602
 603
 604
 605
 606
 607
 608
 609
 610
 611
 612
 613
 614
 615
 616
 617
 618
 619
 620
 621
 622
 623
 624
 625
 626
 627
 628
 629
 630
 631
 632
 633
 634
 635
 636
 637
 638
 639
 640
 641
 642
 643
 644
 645
 646
 647
 648
 649
 650
 651
 652
 653
 654
 655
 656
 657
 658
 659
 660
 661
 662
 663
 664
 665
 666
 667
 668
 669
 670
 671
 672
 673
 674
 675
 676
 677
 678
 679
 680
 681
 682
 683
 684
 685
 686
 687
 688
 689
 690
 691
 692
 693
 694
 695
 696
 697
 698
 699
 700
 701
 702
 703
 704
 705
 706
 707
 708
 709
 710
 711
 712
 713
 714
 715
 716
 717
 718
 719
 720
 721
 722
 723
 724
 725
 726
 727
 728
 729
 730
 731
 732
 733
 734
 735
 736
 737
 738
 739
 740
 741
 742
 743
 744
 745
 746
 747
 748
 749
 750
 751
 752
 753
 754
 755
 756
 757
 758
 759
 760
 761
 762
 763
 764
 765
 766
 767
 768
 769
 770
 771
 772
 773
 774
 775
 776
 777
 778
 779
 780
 781
 782
 783
 784
 785
 786
 787
 788
 789
 790
 791
 792
 793
 794
 795
 796
 797
 798
 799
 800
 801
 802
 803
 804
 805
 806
 807
 808
 809
 810
 811
 812
 813
 814
 815
 816
 817
 818
 819
 820
 821
 822
 823
 824
 825
 826
 827
 828
 829
 830
 831
 832
 833
 834
 835
 836
 837
 838
 839
 840
 841
 842
 843
 844
 845
 846
 847
 848
 849
 850
 851
 852
 853
 854
 855
 856
 857
 858
 859
 860
 861
 862
 863
 864
 865
 866
 867
 868
 869
 870
 871
 872
 873
 874
 875
 876
 877
 878
 879
 880
 881
 882
 883
 884
 885
 886
 887
 888
 889
 890
 891
 892
 893
 894
 895
 896
 897
 898
 899
 900
 901
 902
 903
 904
 905
 906
 907
 908
 909
 910
 911
 912
 913
 914
 915
 916
 917
 918
 919
 920
 921
 922
 923
 924
 925
 926
 927
 928
 929
 930
 931
 932
 933
 934
 935
 936
 937
 938
 939
 940
 941
 942
 943
 944
 945
 946
 947
 948
 949
 950
 951
 952
 953
 954
 955
 956
 957
 958
 959
 960
 961
 962
 963
 964
 965
 966
 967
 968
 969
 970
 971
 972
 973
 974
 975
 976
 977
 978
 979
 980
 981
 982
 983
 984
 985
 986
 987
 988
 989
 990
 991
 992
 993
 994
 995
 996
 997
 998
 999
 1000
 1001
 1002
 1003
 1004
 1005
 1006
 1007
 1008
 1009
 1010
 1011
 1012
 1013
 1014
 1015
 1016
 1017
 1018
 1019
 1020
 1021
 1022
 1023
 1024
 1025
 1026
 1027
 1028
 1029
 1030
 1031
 1032
 1033
 1034
 1035
 1036
 1037
 1038
 1039
 1040
 1041
 1042
 1043
 1044
 1045
 1046
 1047
 1048
 1049
 1050
 1051
 1052
 1053
 1054
 1055
 1056
 1057
 1058
 1059
 1060
 1061
 1062
 1063
 1064
 1065
 1066
 1067
 1068
 1069
 1070
 1071
 1072
 1073
 1074
 1075
 1076
 1077
 1078
 1079
 1080
 1081
 1082
 1083
 1084
 1085
 1086
 1087
 1088
 1089
 1090
 1091
 1092
 1093
 1094
 1095
 1096
 1097
 1098
 1099
 1100
 1101
 1102
 1103
 1104
 1105
 1106
 1107
 1108
 1109
 1110
 1111
 1112
 1113
 1114
 1115
 1116
 1117
 1118
 1119
 1120
 1121
 1122
 1123
 1124
 1125
 1126
 1127
 1128
 1129
 1130
 1131
 1132
 1133
 1134
 1135
 1136
 1137
 1138
 1139
 1140
 1141
 1142
 1143
 1144
 1145
 1146
 1147
 1148
 1149
 1150
 1151
 1152
 1153
 1154
 1155
 1156
 1157
 1158
 1159
 1160
 1161
 1162
 1163
 1164
 1165
 1166
 1167
 1168
 1169
 1170
 1171
 1172
 1173
 1174
 1175
 1176
 1177
 1178
 1179
 1180
 1181
 1182
 1183
 1184
 1185
 1186
 1187
 1188
 1189
 1190
 1191
 1192
 1193
 1194
 1195
 1196
 1197
 1198
 1199
 1200

aggggtgacct ctgtagtatt gagattatac ttcaagtaag ctgttattaa aaaaaaaaaa 15060
 gttatcatat ggggtggcagg ggaaatcatt ctgggatgat ggctaacttc atcagtattt 15120
 gatttatacc tatgcatcat accttatgtt tgttttatgc attttgtggg ttttttaaaa 15180
 aaattatatt tcataaaaac aaattttaaa aaaattaaag tcaagaaccc caaaacaaca 15240
 aagatcagag atacatttct accttatcaa ttcagaaaaa ttacaagttt ttttcttaaa 15300
 aattgtatag catcatggtg attttaagtt acctgtagga atttaataaa ctttgtctta 15360
 actgttcacc aaaactcatt taatattcat gttctgatac tgaaaaatgaa gctgaaaagt 15420
 tttgaaatta caatatgcta gtttaaaaaa gtttactaaa atacataatt tcattataag 15480
 gagtaatatg aaataaaagt atcaaatatg ggaccattaa aaatgtcctt actaacaagt 15540
 tgctaccacac attgtggact cactgcgtcc actgtttgcg agctttttcca gaacgcctgc 15600
 caccagttag ggtagccaag aactcctcat cttcactttc ttctcacta gcttggaaac 15660
 ctgtgattcc caccacact gctgtgacct gaatggggaa gagaaacgcc atagttaagg 15720
 actcttctct tttatagatt totgaattag aatctggcat taaaaagaa caatgttata 15780
 atccaggtc agagtttata gttctatttc actattactt atatggcttg tcctaggaac 15840
 ttaactatta tttacaatgt aagtacctat ttccacaaaa aaattcaaaa ttttggata 15900
 aatatctga agagagaatg gtctattgaa tccaagtag gctgatacat cccaacagta 15960
 ttccagattg agataataat aataccacca attcatcaag tcaaatata tgcttatttt 16020
 ccacaatgga agttttaaaa tagtataaac attttaatat atagcaggct taacttatga 16080
 ttattaaaca gggttctaag aaaatagtat acatcaaata ttaatgtgct tcttgtataa 16140
 tttaggtgac aatttatcca tctgagaaat gcaaaagaga ctttggttag ggggttgagta 16200
 aggagcattc tgtgtcaaa gaaatcactag caaaagaggg tatactgtag ttacaagcta 16260
 taatcactgt acttatttta aatccctctt cagaaccagg tcttaaaaaa tgataaacat 16320
 ggcctcatga ataactatca accaaaactat agaaaagagt gcaagagtg ggtgttctaa 16380
 cttaaaatat ggtgttttat tcaataaatt ttatttaagg ctcaaaaagc agcagcctca 16440
 tccccagaa atcatagtta aatgaaatct tccttactaa aggaaaaatg aatcacataa 16500
 tttacgtga acatttttaa aacactctaa agcaacaaaa ctattcaatt gtatgtgata 16560
 tggcttagaa aggcattgtag gtaaaaagga ctaaaaactc taataatggt tgggccaata 16620
 gtaaatgtgt tagttctact ccattaagca ttctcaagc agtgtaaaaa tcagagtcca 16680
 agttacactt tgatgtgtag atcctttgaa agccactcta cctgtttta tatgaagcat 16740
 ccgcagctaa aatgaacacc tagtgaagag tatgaatgct gcaatacata agcagacgtc 16800
 agaattgtcc caagctgatt ctaagttact ttaaacatgt atgcagagtc agaatatgac 16860

ttactttctta gaagtaacag ataattacct ttggcataat gaaaaaaact ttaaatgtaa 16920
 gttaatacag gtattttccc tttagcaaaag ctttgctttt aaaagaaaac ttcaaaactt 16980
 aaattaaaat agggaatgct ctactatgta gtaaaaatac tttttagatt actgaagcaa 17040
 agaaaaggaa ggatttctatg agggaggaaa agtgggagaa aaatgtaaaag aaaaaaagga 17100
 agaaggaaaag aaaagagaaa aggaggaaaag aacacaagga cagaaaggcc tattgaaata 17160
 tattattttct ttcaaaatttt aaacgagcag aataaaattct tttgttttat aactatgaaa 17220
 taatctatgt tcctcttctc tatgcttgga aaatttagac aaaatgttaa gagtaagtac 17280
 tacattggat ttccgggtct tcagctctga aaacaagctg tttcttaaca tacgtcaatt 17340
 ttctatattt catgtcattt ctatttgcaa atgttataaa gttcaatatg atgtaaaaca 17400
 tggttaaatg aagttaaaaa ataagtataa catacattag tttggctatt ccaaatttca 17460
 tgcacattaa ctacgccaca catctaacac agtcagccct ccctatccag gggttctgca 17520
 ttgtcagatt caactaacca tgggtcgaaa atgtttttgt accaaacatg tacaggcttt 17580
 ttcttctgtt atcattccct aactacagta taacaactat tttoacagtg tgtacatgtg 17640
 ttgtgaaatat tataagtaat ctacagataa tttaaagtat acaagagggt atgcatagggt 17700
 tatatgcaaa tactacacca ttttatatca gactctcaaa catcagtaga atttggtaac 17760
 ctaggagggt cctggaacta atcaccocga ggtatcgaca gatggctata tataaatcac 17820
 ctagtgaatt caggattcac attatttcac aactagtata attttatgtt gttcacataa 17880
 ttgtgtcaca acatatatcat gcagacaggt gactttcatg aaaagattac acccaagata 17940
 taccatattgt ctactcaaat acggtttcca aatgtgtatc caatcttgtt taattataat 18000
 taaaactcacc attccattga taagcgacct ctaccaacct gcttatcccc tccaagcaat 18060
 ataacagtgg ttctctgaac caatattgac cctcctttaa attgatagcc tttttttaa 18120
 aagctaacca ttgagaagta cactactgtg aagacagaac atattctgta aaatgctccc 18180
 aagatatcaa agtcagatga tacaactgaa tgtttatgct agattatatt tctaagctga 18240
 gaattacatt ttaatatacc ataagcaatc tgcaaaagaa gcaacttgcc taagatttc 18300
 aggagtttca agtatgcata tgtcaatatc tgtatcaata tgtaatatca atataatcaa 18360
 tgcacacaac aatacgtaac tgtacttata tcatctcctt agcactaatt attacaaaca 18420
 atctgcatgc actgcaaaagc aaaagtataa tataaaatcc caaaaaacct tgaaaattta 18480
 ataaaaccaa aaaacaggca tcacacacaa gaactgagc gtatacttca ttaatgagta 18540
 tgatatcctg atatgaaatg tcaaacaaaa ttaccaggc tcagggttaga aataaagata 18600
 ggacattagt ctttgtattt ttaaattgat tttttcttct aatatcctt aatgataacc 18660
 ctatatatta cctacttaaa attatttagca aatagttatt ttaaaagtat gagtaattag 18720

accaaaaagca actctcatat ttacccaaaa gaaggaacca ctaccaagaa tcaaacgcta 18780
 gtaattctgt tcttaacaga cagggtgtgt gtattctggc atgtttacatg aaaatcactt 18840
 atgagaagaa cagaaaaaaa aattagaagg tagttttcac tatggaaaata ggtaagtgat 18900
 taagcagatt ttcttacacc atgaaattgt cagcagactc aataatcacc ctaaggggca 18960
 tcattctgga tgccgacatt ctctatgatg gaaagggact gaaagtaaaa tgcactaatg 19020
 acataaagaa accaatatcc aatagtaaag ttgaagaaat aaacattctt tggacaggaa 19080
 ctaagctgaa gtttgcaact accaagaatg tattatgcca gcagtaaaat aggaaactaa 19140
 agcccatgtc aaccaatgaa aaatggggagg actgaaatca atcattaaag cagcagcaag 19200
 gttctaacta ttctaaggta taggctacct ctggcgtata ttatcagagt tgacaattct 19260
 tccaagaat tctaactca actgtaatct gaggtccttt aaaaaataat ataaccagg 19320
 cagtacactt acattttgta atattttctt ctaagagctg tacattaaga ttttatttgt 19380
 gatataaata ctatcaaata attagctata gaacagctct attttcaaca gttataacat 19440
 ttaagccat ctacacatta acotaaactt ttatcaaagt tcaaaactga gccgggttac 19500
 gttggctaac accgtgtagc ccagcacttt gggaggccaa gatgggcgga tcacttgagc 19560
 ccaggaattc gagaccaacc tgggcaacat ggtgaaaccc catctctata aaaaatacaa 19620
 aaattagctg cgcctggtgg tgtgcgcctg tagtccagc tactagagag gctgagggag 19680
 gagaatcacc agggcctggg agatcaaagc tgcagtgagc tgagatcgty ccactgcact 19740
 ccaccctggg tgacagagtg agaccctgtc tcaaaaaaaa aaaaaaaag aaagaagaa 19800
 aaaaaaatca aaactgatca cttgaggtcc aacttatgtt tactatatct acttatattc 19860
 ccaaaagacat cttaaaggaga gatgaaatca taaaagggtg aggatgagaa agaaaatagt 19920
 aagtcagtaa ggtcaatttt tacatatatt aggctagcat aataaaaaata tgagtgtctt 19980
 attattattt ttttttgaga cagagtcttg ctctgttgcc caggctggag tgcagtgtg 20040
 caatcatggc ttactgcaat gtctgccttc caggttcaag caatccttgt gcctcagcct 20100
 cctgagtagc tgggattaca ggtgtgcgtc accctgccca gctaattttt gtattttcag 20160
 tagagacagg gtttcaccac gttaaacat gagtttgccc aggatggctt caaaactcca 20220
 aagtgctagg attacatgcy tgagccactg cgtctggcct aaagtgtctt attataacca 20280
 agaatttatt tgtggagaga ggtaaagaaa actcattttt agtgaataaa ttaaaactgc 20340
 atcatcaca atctatcttt caaaatgagg tattaactat ttggtcttc aaaaattacc 20400
 catatactac atgcatgagc atgggaattg aagttatttt attcctaagt ttgagacttc 20460
 atgttttaat gtgatcacta aaaatttctt aattgatgat taggaaaata actttctgta 20520
 aaattccaga attttagctg tttcaatctc ttcatattaa ggggagaaca ttatgttttt 20580

actttctgtg catgcacttt ctttattaga agaaaatgga ctgagggcag taagcaaccg 20640
 aaaaggaaga gtaataagaa gcctgatgtg tgtgaaaact ggagacacgt ctcaaatcat 20700
 aaaaagtatt gacagaagag gcataaaaaa taaaagtaat gaacttaata tatgaaagg 20760
 aataatgatt aagagcatag gctataaagc cagactggac tccctggatt caaatcctgg 20820
 ctcttctaatt tactaggtag gtaaccctga gcaagtttca atgaccaatc tttttctcaa 20880
 ttacotcagg tatataaagg ggacagtaac agcatttaac ccagaggaca ataaggatta 20940
 aataaataca tgtaaaaata tttaaaacag tacctgggtat tcaataaagc gcaataaatg 21000
 ttagtctgcta ttattattca tctaaacttt actttcatta ccagcaatat tttttaatct 21060
 taaaaatatt gaataaaaca atgacctagc ttagtaaata aattcataat gagaaaatgt 21120
 tgatttcatt taataataac ttttagtgtt tgggataaca ctttgcatat ttttaattcc 21180
 ccagctataa ataactcaaa taatttgcca tcagatgato tgttattttg aagtaacaa 21240
 ataaagcatt tcctaaaaaa gttctaatac ataacttttg ctctcatctt atgtttttaa 21300
 acaaaaatgg caaatcatct gcatacaata gttcctaact ttataacatg acaattgttt 21360
 taaaaatata ctgtcggaag aagcaactga agtcctagaa aatagaaatg taatttttaa 21420
 ctattccaat aaagctggag gaggaagggg aaaaacatat ctgccaaata agcttataat 21480
 ttaatagttgt tttcagtttt caaaaatcca cataggaagc aatttaagcc taaattgcct 21540
 aggtctcaat ctacagcgtg tagatagctt agggcaatca aaacttgctg tgttgggctg 21600
 cccctacag gactcaattt acctatttct tttaaaaggt gtgtaagtga gaaatatgat 21660
 tcaagtttta cattaacaat attaatgcta aagcagatga ttatcattca cgcattcact 21720
 ataggaggaa acagtctctg agaaccatct atagagatac agagagaaat gaaacaatcc 21780
 ttgtccttga ggaattaata gtttactgct tacagagaaa ctacatacat ggtgaaatat 21840
 ttaaaaatag ctcatgatat cctctatgat attatgtttg ctatagaaaa agaacaaggc 21900
 tgaagatcta agatccaagt tctactgttg gctctgccat caaacaataa gtaaaacaat 21960
 gtacaagtca gttttgggga agctgtotta ttcccaaat gagggagtta aattagttaa 22020
 ttcttccagc ctctatggct ctaatatctc acagttacat ttgtcaaaac aaaaggtaga 22080
 aggaaatgtt tcaaaaacag acttcgcaga aagaacatct atatgatatg aagggtctgg 22140
 gcatatgtga agaaatcaag gaagacttct tgaggaaggt gacatctgaa gtaactttag 22200
 aagcactctg ggagccaagg ctattcccag gagttaacag agtcagataa taaaagatca 22260
 aagatgttta ggggaatago atgcagtgtt atttggttgc agtctagcta tatttttagga 22320
 aacatcaaata taatatcagt ataaaactca acagaatgga gggagaaaaa gcaggtagaa 22380
 aaatctaaga accactaaaa tagttcatct agaagataaa ggaccatgta gctaaatcag 22440

Tgcaaatggc	aagaagggaa	taaataaga	cagttctggt	ccattagaac	tgcaactcaa	22500
caaaagtgat	caaaagagtt	attccaaagt	attgacctgg	taacttgaag	aaaagtaaag	22560
aaagaggaaa	ctggacactg	aaacagaaga	agtagattat	gtatttggtg	gtgaatggaa	22620
gtagattggt	gggaccagtt	agaacctcac	agagaagaac	tatgttaaga	ccagaataac	22680
ggccaggtgc	ggtggctcat	gctgttaate	ccagcacttt	gggaggcctg	ggtggggcga	22740
tcacctgagg	tcaggagtgc	aagaccagcc	tgacaaagat	ggagaaaccc	tgtctccctc	22800
gtctgtacta	atacaaaatt	agccaggtgt	ggtgtgtgcat	gctgttaate	ccagctactc	22860
aggagggtga	ggtaggagaa	tcgcttgaac	ccgggaggcg	gaggttgcag	tgagctgaga	22920
tcgcaccatt	gcactccagg	ctggggcaaaa	agagcgaaac	tcttgtctca	aaaaacaaac	22980
aaacaaaaca	aaacaaaaca	cagaaatata	tcaattaaaa	aagttagcta	ttcaccagat	23040
atgttccact	ggtcataaaa	caaaagaata	caggaggcat	gacaagccat	catcattgct	23100
gttaaaataa	ctcacagcaa	aattataatg	atttaagtca	ataacatcta	ataattccag	23160
ctatatgtgt	caatttaatt	tattatgtgc	caggcacaat	agtttattaa	aggtattacc	23220
gttaattttc	acaataaccc	tattttacag	attataaaat	ggaggcccag	agatgttaag	23280
tgaaacgagcc	aaatcaccta	gttacctgga	atataaaact	agaactgcct	aaatcaaaag	23340
ctctcaatct	taaccacatg	ctatactgat	gcattgtcaa	gattcaattc	attcagattt	23400
ctcaaggtta	tcggaaaacc	tatgtagata	aaaatttcca	aaataatcaa	ggatatgtaa	23460
cttttacaga	aagcaatcac	tgatcatcta	ttgcaatact	catgtttctta	agcaatatac	23520
tgagttgaaa	tttttatatt	ttataaaata	ttagaagaaa	tacatttttt	aaaactttta	23580
aaaacacctc	agtttttatt	ctcttcccca	aatttcaaca	aaatccattt	atccaaactt	23640
gaggttgaat	cattaaagtgt	gtgatatcat	cagtaatagc	agagttagga	ccctgaatat	23700
actctcctcc	ataaaagcaa	caagaacaca	aaaattctca	aaatgaactt	tttctgaaat	23760
ctttcaaaag	ccccactctc	agaaaactgt	cattatttga	tctgccagtt	ccctagaaaa	23820
acctccctca	taggacatta	tttgacttga	ctcagagctc	actcagtcca	aacaatttta	23880
tcaccaggag	agttttgtga	aaatcagttg	caattgttaa	acatcacatc	tgccatgaga	23940
tagcaataac	agatgggaca	aacaagctaa	ccaaaaaatt	aaaagaaaaa	ctgggggaaat	24000
aagaaatcca	aaggggtgtc	gaaaaagttc	aacatatctc	tgataatcca	gaaagccata	24060
cacatgtata	gagctgtgta	cacgctcaaa	aaacatctac	gaaggcccta	aactctcacc	24120
tatgggaaac	cctgaggctc	tgtacaagaa	gaaagtaaaa	tccagttata	aattgcttgc	24180
cgtatcattg	aaggcaatgc	cccaacattc	acacataggc	ccctggcaca	gattggaaga	24240
tactctagtt	ctaggcattc	aagaaaatct	cttctaatac	tcagatgata	actaaactca	24300

Ccaagcagta actttagggg cctgtgtgat aaaaaataaa aacctgaaag aattagtcca 24360
 ggaagaaac taaacaagca acagcaacaa caaaaacaga ccttgggaaa ggggggaagc 24420
 atctggtttc cagagttatt ctgttatact atataaaata ttcaggtctc aacaacaaca 24480
 aaattacaaa gacatgcaaa gaaacaagta taagccacaa actgggggga aaaagcagca 24540
 gaaactggcc ctgaaaaaga ccagatgctg gacttactgg acaagaactt taagagagtt 24600
 attttaata tgcgcaaaaga actaaaaaaa agtttatcta aagaactaca ggaaagtatc 24660
 agaacaatat ttctgatcct tcagaagaac cactttttgt cactacagat tagttctgtc 24720
 tggcttagaa cttcttaaaa acagaatcat agagtatatt ctctttatat cagctctttt 24780
 tactcaacac aatgttgtgt gagatttata catgttgttg catgtatcat tcccaaacag 24840
 aaatagaaat tatagagata aataggagtt acaaaaaagt accaaaacaa aattctggag 24900
 ttgaaaagca caaaaaactga attaaactga ggggtcaac agctgatttg ggcagccaga 24960
 gaataatc agcaaatcta aagataggtc aattgcgaga aagagaggga agaaggaagg 25020
 aggaaggaa agggagctca gagacccaag agacaccatc aggcatacca atatacatat 25080
 atgagagggc ccagaagaag atgcagaaaa agggtcagag tatctgaaaa aataatggcc 25140
 taaacttcc cgaacttgac cccaaaaatt aatctacaca tccaagaaga taaacaaact 25200
 aaaaagaata aaatcaaagc gatccacacc taggtacatc ataatacaat gactgaaata 25260
 aaagagaga ctctcaaaac aggcaaggga cttatgtaca aaacatcttc agattaataa 25320
 caatttctc atcagaaatg atgttgtcaa taggcaatca gatgacataa tcaaagcact 25380
 gaagaagta gaatgtctgg gacctggaat gctgggtgac acctgtaate tcagtatttt 25440
 ggtggccaa ggtgggagga tcacttgagg caaggagttg aagaccagcc tgggcagcag 25500
 aaagaggctc tgtctctaca aagaataaaa agattggctg aatgtggttg tgtggacctg 25560
 tagtccagc tactcaggcg gctaagggtg aaagatcgct tgagcccagg agttggaggc 25620
 tgcagtgagc tatgactgtg ccactgcact ctgacgtg agaccctgtc tctataaaga 25680
 aaaaatgtca accaaaaact acatgcagaa aaactgcact tcaagaaatg atcagtacct 25740
 tgaagctctg aaggtgctta agactgtaga tcaataccat agaaaaataa ttagtattta 25800
 ggaatgtaag aaaattaaga cagccttgtt tgataactac acataatact gtaactgttc 25860
 ttgcaactgt ctggttattg tcaagctatg agcacaact gatgactgaa atacagaata 25920
 cagaacagga tataaaactc tatcaggtaa agttaggcaa gcaattacta gttgtaattc 25980
 aacttgaagg agaaggaata aggaaccaac tcaaacaggc cagcaatgaa ttgtaaaaaa 26040
 gcttaaggtg aaacaaacag ggaataaaaa caactcagaa cctaagcata tcgtaagaac 26100
 ctaatctaac aaggaggggc ttaactgat tattttacag cttgggtgca attatccac 26160

aaaaaacttt caggagtttc accagttccat aaactatttg gttattagaa aatagcttta 26220
 ttgggctacc ctctttgggt cccctccctt tgtatgggag ctctgttttc actctattaa 26280
 atcttgcaac tgcactcttc tggctcgtgt ttgttacggc tcgagctgag ctttctactct 26340
 ccaccacca ctgtctgttg ccgccaatgc aggcctgccca ctgacttcca tccctctgga 26400
 tctagcaggg tgtccgttgt gtcctcgatc cagtgcagac cccattgccg atcccgaactg 26460
 ggctaaagac ttgccattgt tctacgcgg ctaagtgcgc gggttcatcc taattgagct 26520
 gaacactagt cactgggttc caggtttctc ttctgtgacc cgtggcttct aatagagcta 26580
 taacactcac cgctgggcc aagattccat ttattggaat ccagaggcc aagaacccca 26640
 ggtcagagaa cagcagcctt gccatcatct tagaagcagc ccgccaccat ctccggagtt 26700
 ctgggagcaa ggaccccctg gtaacaattt ggcgaccaca aagggacgtt aacccgcaac 26760
 catgaaggga tctccaaagc ggtaatatgt gaccactttt gcttgctact ctggcctatc 26820
 ccttagaatt ggaggaaaat actgggcacc tgtcggccgg ttaaaaacga ttagcatggc 26880
 agccagactt tagactcagg tatgaggcta tctggggaag ggctttctaa caaccctcaa 26940
 ccttctctgg ttgggaacct tggctcgtc ggagccagct tccacttcca atttctctgg 27000
 ggaagccaag ggctgactag aggcagaaaag ctgtcgtccc gaactcccg cctagccgg 27060
 ctgagatcat gtgcagcca gaagtctcta ctcaacagtc gcccatgcgt gcgctctac 27120
 cttcccttct gtccacacac tctgggtcc caaccacgac tttctgaaa gtgtagcccc 27180
 gaaattctcc ttacctctga atctacttcc tctgacccct gctcctagg tactaatggt 27240
 ctgagacttc atttctcta gcaagttgta tctccaaagg gatctaagga agctctatgc 27300
 tggccctta ggcctatagg ctataaacc agggagtctt gtccctgggt tccctctga 27360
 tttaggtata cagctctaga catgggcagt tatgtgggac ctgttcccca ccacccttg 27420
 caggggccca agtttgttaa tggctaagag aggaaacaga gagagacaga gagaaagaga 27480
 cagtgcagaga cagacagaga cagagagaga gagagacaga gaggagagag agagagacag 27540
 ggaggacag gagagagaca gagaggagag ggagagagac aaaggagaga aaggagcaga 27600
 gagacaaaca gggagtctga gaaagaaaga caaagataga aatagtaaaa aaaaacagtg 27660
 tgccctattc ctttaaaagc cagggtaaat gtaaaccta taattgataa ttgaaggctc 27720
 tctcgcgac cctataacac tccaatacta cctgttgtc agcgtaaaca agggcgtagc 27780
 ctgaaaacac taagaccact gacaacccat agccttcta tcaaaaatcc ttaacatcca 27840
 gtgacctgcg gatggcccaa atgcattcaa tctgtagcgg caactgctt gctaacagaa 27900
 aaaagtagaa aagtaacttt tagaggaaac ctcatgtga gcacacctca cgggttcaga 27960
 attattctaa gtcaaaaaag caaaaaggta gcttattaac tcaaaaatat taaagtatgg 28020

ggctattctg tcagaaaaag gtaatttaac actaaccact gataattccc ttaacctgc 28080
 agatttcctt acaggggatt taaatcttaa ttaccataca aaggtccgag cagacctagg 28140
 aggaactccc ttcaggacag gatgatagat gggtccctcc aatgactga ggaaaaaacc 28200
 acaatgggta ttcagtaatt gatagggaga ctcttggtga agcagagtta gaaaaattgc 28260
 ctaataattg gtctcctcaa atgtcagago tgtttgcaact cagccaagcc ttaacgtact 28320
 taccgaatca aaaagactat ctcaatcctg actcaaaagc ttacttatac cctctctgaa 28380
 acgaatttgc ctaagaactg tigtattatgg gaatgcatct tgatggagca gctgggttgt 28440
 tatgaaatac tcaggaactc agcctagctc taggaactcac cctgagcac aaaggcaatg 28500
 ttgggcacgc tggtaaaggga ccactagaat ccagcagccc ggaccccttt ctttgtgac 28560
 aagaaaggcg ggaagggggg tgagggtctg tacatcagtg agcataacta atccgataag 28620
 cagaggcca tgggtgggta cacaccccg aaaggaataa gcattaggac cataggagac 28680
 gctctaggac taatgtctcat cggaatga ctagtggtgc tggcatccct atgttctttt 28740
 tcagatagg aaacgttccc ctcaaggcaa aaacacccct aagatgtatt ctggagaatt 28800
 gggaccaatt tgactctcag atgctaagaa aaaaaagaca tattcttctg cagtaccgcc 28860
 tggcaacgat atactcttta agggggagaa acctggcatc ctgagggaag cataaattat 28920
 gacaccatct tacagctaga cctcttttgt agaaaagaag gcaaatggtg tgaagtgtca 28980
 tgcgtacaaa ctttcttttc attagagac aactcgcaat tatgtaaaaa gtgtgattta 29040
 tggcctacag gaagccctca gactctacct cctacccca gcatccccc gactccttec 29100
 gaaaataata aggacccccc tcaacccaa acggtccaaa aggagataga caaaggggta 29160
 gacaactaac caaagaatgc caatattccc cgattatgcc cctccaagc ggtgggagga 29220
 gaattcggcc cagccagagt gcacgtacct tttctctctc cagactttaa attaaaatag 29280
 acctaggtaa attctcagat aaccctaagt gctatattga tgttttacaa ggtttaggac 29340
 aatcctttga tctgatattg agagatataa tgttactgct aaatcagaca ctaaccccaa 29400
 atgacagaag tgtcgccgta actgcagcct gagagtgttg cgactctctg tatctcagtc 29460
 aggtcaatga taggtcgaca acagaggaaa gagaacgatt cccacaggc cagcaggcag 29520
 ttcccagtg agacctcac tgggacacag aatcagaaca tggagattgg tgcccgagac 29580
 atttgctaac ttgcgtgcta gaaggactaa ggaaaactag aaagaagcct gtgagttatt 29640
 caatgatgto cactataaca cagggaagg aagaaaatcc taccgccttt ctggagtgc 29700
 taacggaggc attgaggaag catacctctc tctgtcaact gactctactg aaggccaact 29760
 aatcttaag gataagttta tcaactcagc agctacagac attagggaaa aacttcaaaa 29820
 gtctgcctta ggcccggaac aaaacttaga aaccctattg aacttggcaa cctcagtttt 29880

ttataataga gatcagatg agcaggcaga atgggacaaa tgggataaaa aaaaggccac	29940
cgcttttagtc atggccctca ggcaagcgga ctttgagggc actggaaaaa ggaaaagcta	30000
ggcaaatcaa atgcctaata gggtttgctt ccagtgcggt ctacaaggac actttaaaaa	30060
agattgtcca aatagaaata agccgcccco tgcctcatgc acctcgtgtc aagggaatca	30120
ctgtaaggcc cactgcccco ggggacgtag gtctctgag tcagaagcca ctaaccagat	30180
gatccagcag caggactgag agtgccccgg gcaagcacca gcccatgcco tcacctctac	30240
agagccctgg gtatgcttga ccattgacgg ccaggaggct aactgtctcc tggacactgg	30300
tgtggccttc tcagtcttat tttcctgtcc cagacaacgg tcctccagag ctgtcactat	30360
ccaaggggtc ctaggacagc cagtccactag atactctctc cagccactaa gttgtgactg	30420
gggaacttca ctcttttcac atgcttttct aattatgcct gaaagcccaa ctcccttggt	30480
agggagagac attctagcaa aagcaggggc cattatacac ctgaacatag gagaacaccc	30540
gtttgtgttc ccctgcttga ggaaggaatt aatcttgaag actgggcaac agaaggacaa	30600
catggacgag caaagaatgc cgtcctgtt caagttaaac taaaggattc tgectcctt	30660
gcccacaaa ggcagtacc ccttagacc gaggtcaac aaggactcca aaagattaag	30720
gacataaag cccaaggcct agtaaaagca tgcaatagcc cctacaataa tccaacttta	30780
gagtagacaga aaccagatgg acagtggagg ttagtgcaag atctcaggat tatcaatgag	30840
gtcactgtcc ctctatacct agctgtacct aacccttata tctgtcttc ccaaatacca	30900
gggaagcag agtggtttac agacctggac cttaaggatg cctttttctg catecctgta	30960
gattcctgact ctcaattctt atttgcttt gaagatcctt caaacccaat gtctcaactc	31020
gcttgactg tttcacccca agggttcagg gatagcccc atctatttgg ccaggcatta	31080
gccaagact tgagccggtt ctacatacct ggcaactctg tcctttggta tgtggatgat	31140
ttttactttt agccgcaggt tcagaaaacct tgtgccatca agtcacccaa gtgctcttaa	31200
attttctgcg tacctgtggc tacaagggtt ccaaacccaa ggctcagctc tgctcacagc	31260
aggttaaata cttagggcta aaattatcca aaggcaccag ggccctcagt gcctattctg	31320
gcttatcttc atccccaaa cctaaagcaa ctaagaggat tccttgacat aacaggtttc	31380
tgccaaatat ggattcccag gtacggcgaa atagccagac cattatatac actaattaag	31440
gaaactcaga aagccaatac coatttagta agatggacac ctgaagcaga agcggtcttc	31500
caggccctaa agaaggccct aacccaagcc ccagtgttta gcttgccaac ggggcaagac	31560
ttttctttac atgtocaga aaaaaacaga aatagctcta ggagtcctta cacaggctga	31620
tgagcttgca acccatggca tacctgagta aggaaattga tgtagtggca aagggttggc	31680
ctcattgttt atgggtatg gcggcagtag cagtcttagt atctgaagca gttaaaaata	31740

tacaaggaag	agatctgtgt	agacatctca	taacgtgaac	ggcatactca	ctgctaaagg	31800
agacttgttg	ctgtcagaca	accgtgagga	aagtaactaa	aatcgtaaat	ccccatggcc	31860
ctcccttata	atatttttct	ctttaactgtt	ctettacccc	ctttactctc	cactgcaccc	31920
cctccatgct	gctgtacaac	cagcagctcc	ccttaccag	agtttctatg	aagaatgcgg	31980
cttccagaa	atattgatgc	cccatcaaat	aggagtttac	ctaaaggaaa	ctccaccttc	32040
actgccaca	cccatatgco	ccacaactgc	tataactctg	ccactctttg	catgcatgca	32100
aatactcatt	attggacagg	gaaaatgatt	aatcctagtt	gtcctggaag	acttggagcc	32160
actgtctgtc	ggacttaact	caccatact	ggtatgtctg	aggggggtgg	agttcaagat	32220
caggcaagag	aaaaacatgt	aaaggaagta	acctcccaac	tgaccogggt	acatagcacc	32280
cctagccctc	acaaaggact	agatctctta	aaactacatg	aaacctcca	taccatact	32340
tgcttgtaa	gcctatttaa	taccaccctc	actgggctcc	atgaggtctc	ggcccaaaac	32400
ctactaact	gttggatgtg	cctccccctg	tatttcaggc	catgcatttc	aatccctgta	32460
cgtgaacaat	ggaacaacta	cagcacagaa	ataaacacca	cttccgtttt	agtaggacct	32520
ctgtttcca	atctggaat	aaccataacc	tcaaactcta	cctgtgtaaa	atttagcaat	32580
actgttagaca	caaccaactc	ccaatgcctc	aggtgggtaa	ctcctccacc	acgaatagtc	32640
gcctaccct	caggaatatt	ttttgtctgt	ggtaccttag	cctatcgttg	tttgaatggc	32700
cttctcagaat	ctatgtgctt	cctctcattc	ttagtgcccc	catgaccatt	tactactgaac	32760
ctgatttata	caattatgtt	gtacctaaag	cccacaacaa	aagagtactc	attcttccct	32820
ctgttatcgg	agcaggagtg	ctaggtggac	taggttcttg	cattggcggt	accacaacct	32880
ctactcagtt	ctactacaaa	ctatctcaag	aactcaatgg	tgacatggaa	tgggttgccg	32940
actccctggt	caccttgcaa	gatcaactta	acttccctagc	atcagtagtc	cttcaaaatt	33000
gaagagcttt	agacttgcta	acctctgaaa	gagggggaag	ctgtttattt	ttaggggaag	33060
aatgttgta	ttagtttatt	ttagcggaag	aatgttgta	ttagtttaat	caatcctgaa	33120
ttgtcacaga	gaaagttgaa	gaaattcgag	attgaataca	acgtagaaca	gaggagcttc	33180
aaaaaacacca	gacctggggg	cctcctcagc	caatggatgc	cctggattct	cccttcttta	33240
ggatctctag	cagctctaata	attgatactc	ctctttggac	cctgtatctt	taacctcctt	33300
gttaagtgtg	ttctctccag	aatcaaatgt	gtaaagctac	aaatcgtctt	tcaaatggaa	33360
ccccagatga	agtcctatgc	taagatctac	cgtggacccc	tgaccgggcc	tactagccca	33420
tgctccaatt	gtaatgatat	cgaacgcacc	cctcccgagg	aaatctcaac	tgacacaacc	33480
ctactatgcc	caaattccgc	aggaagcagt	tagactggtc	gtcagccaac	ctccccaaca	33540
gcacttgggt	tttctgtgtg	agtgggggga	ctgagagaca	ggattagctg	gatttccctag	33600

gccgactaag aatcccaag cctagctggg aaggtgacca catccacctt taaacactgg 33660
 gcttgcaact tagctcacac ccgaccaatc aggtagtaaa gagagctcac taaaatgcta 33720
 attagacaaa aacaggagggt aaaaaaatag ccaatcatct atcgctctgag agcacagcgg 33780
 gaaggacaat gatcgggata taaaccaggg cattcaagcc ggcaacggct acctctcttg 33840
 ggtcccctcc ctttgtatgg gagctctctc tgtcttctact ctattaaata ttgcaactgc 33900
 aaaaaaaaaa tagcttaatt gaagaataaa ttaatacaat aaaggaata cattttaagt 33960
 atacagtcca aactgtaaca gtgttacagt ttcaagagga ccccttcaac aagatattgg 34020
 gcatttccat catgcccata aagttccttc ttgtccctta ctgggtgggt ccattctctac 34080
 tacacctccc tgacctggcc cagaccttgg cctcagaaga atcatttttt ttgctactaca 34140
 tattagtttt gtctgttcta gaacttctta aaaacagaat catagagtat gttctctttg 34200
 tattggttct ttttactcaa tghtaatgttc tgtgacattt atccatatta ttgcattgat 34260
 ttttcccttt aatcctgaat agtatgctgt tttaggaata taatgcaatt gtttattcat 34320
 tgacctgttg acagatatct gagctattat gatggatatt atgaataatt ctgctatgaa 34380
 caactctgta caatgttttc tcggacatat attttcattt ttcttgagtg gagctgttag 34440
 tttctgttga tcagaaagta agcatatgtt gaattttgaa agaaactggg aaactcttgt 34500
 cttaaagtgat ttgtaccatt ttacactcct actaataatg tatgagagtt atatttgctc 34560
 gcagcccttt ttactacttt gttaatcttt ttagtactgt caaccttttt aatttatcca 34620
 tttctaggga cgtgaagtag tatctcactg ttattttcat ttctctgatg agtaacaata 34680
 tgggtgatct tttcatgtgc ttattagcca ttctatatc ttttgtgaaa tagttaacct 34740
 gaaatttgtaa ctaaagggtgc tttcctgagt ttccaggtagt aagcctattt ccctcaagtg 34800
 aataaactac agtcttggaa tgaaaaatta aacacagtgg agacattttt tgtataagtt 34860
 gttttactct gtgtatgtct ggtttgctta gtctattatt atatgcccc tgaagcaaaa 34920
 cacagtgtct atttcactaa tgagtatcac tagcacatag aactgtgctt gcccaagca 34980
 tgaactcaat aaatatgtta atgtgtatgc atgcacatac atctacatgc atgtacatct 35040
 atacacacat ataaacatat attaatTTTT agaccacaaa atctaagaaa actaattctt 35100
 gagcctctgg tttgaagaat tctcaaatTA ttaacatac tttatgttcc actccacatc 35160
 cactgtacct gaaatagccc tactgttcta ctttggtaaa tcaggcaaat ttaatttttt 35220
 aaataattaa gattccaaat aattttaaaa tataatttga aagttaacaa tgaatacat 35280
 tacataaaaa gaaaatttta aataaaagca aaactaaacc caataagagg aaagaagtt 35340
 gggctgtatt tctttaatcc tttaaaattc aaatcacaca atgctccaat gaaatcttca 35400
 ttaactgaac caaactatgc ccatgaaaga tctcatatgc aactgctaaa acctcaataa 35460

acatattcat cttcttgcaa aaaagatatt tctttataat atgcacatgc agtatatact 35520
 attttgaggc agattgtac tttagtcctt gttccattgc ttaccggctg gctgtccttt 35580
 gtctgggtcat tgacctccaa cttaaaaaat aatacttgcc ttgtctaccc cacagaagtg 35640
 ttatgaaagt caaacaaggt agcataaagg tattttaca gatataaagt gctataatac 35700
 agattttaaa aatcactota catccataa tactttgttg tacaatttta gagcaatagt 35760
 agaaaataac aattattgcc taattgaaa tccagtcctg aattccataa aatgtatgat 35820
 atgaacatta tagtacatca tattacgagc cccaaataat cactgcttat atagttggtt 35880
 aggatttcct tagttgttgc atatagttta tatattttat cagtccttat tttgtgagag 35940
 gcattgtgag gagcataaag acataagcac agtacagagc cttagctttc ctacattttac 36000
 taaagaagac ttcttcttgg gtattttaac aatatttaaa gtattctggg aagaaatgaa 36060
 attaacttca tagactgacc ttagattact atcattacaa aaagatgcct gagtgatctg 36120
 cttttaacat accagttatt atcttataac tgttatattt acttgaatca gaagtgaagt 36180
 ctttttaagc actaagcatc cattctatac tttcttgtct ttacatatga gatacaaatc 36240
 atatttttaa aacttttatt tacttttatt ttttagagac ggagtccttg tctgtagccc 36300
 aggcctggagt acagtggcat gatcttggct caccacaatc tccacctcca cttcccaggg 36360
 caagtgaa caaatcatac tttaagcac agattctcaa catgtatcct agcatgctac 36420
 gccataact aggggtgtgaa ttaagtatta aagacagctt accccaaata t tactgtaac 36480
 tataatctct aatgaaaaa gaacatatta acaactatac ttggatggga tctctgggagc 36540
 taacccatcc ctctctcccc ttctctccaa attccatctc ctattaacac accagctctc 36600
 ctgagctaag cagctcctgg ggttggggaa ggggtgtacat ggagaaagct agaacctcta 36660
 cagtgttttc ctctctggga ggaactagca ggcatacgaa cagaaaaagc tgaataaaaag 36720
 gctgaatcct ttctattcct gaggcagaca gagagaagac cagggaacaa agagacttgc 36780
 accaagagcc ctgccaggta ttgatacctt tgatactgag aaaatatctg ggatatgaaa 36840
 tacaaatgct aaataagtat ctttgaaata ggggtaaaag aataaagggt cttgatgagt 36900
 aaaatgggta gtatttttta ataacctgat aatgagcttt aggaaaaggg aaggccaacg 36960
 ttatggaatg aaacacaga ggtaccaa ttaaaagcat aaaaaaagt ggaggggggg 37020
 aacccaataa cttcatcaaa ctagcaaaata acttagtata atttctaatt agaaacgcta 37080
 gaaggaaatc acttagatct gataaagact aggcataat tctaactgat gaaacactta 37140
 aactgtatca attaatacca gaaaacaaac acagaaaagt ctactagaac catcattatt 37200
 cagcacagtc ttggtaatgc aatactataa tagcaatgca ataagcaag aaaaaaaaa 37260
 gtttgtaaaa acacaatagg atgagatttt tgtttttcca atgccataaa taactagaaa 37320

tggaacaaa ataaagaaaa acaaatctc	caaacacct ggaaataaaa agaaaaatgg	37380
tctatttgaa gaaaacctta aaatctatgc	agaacataaa acaaaatctg aataaaaaa	37440
aatatcatgt tctgtctgg gaagacttaa	tatcataaga aagtgaatta tatcaaaatt	37500
taaatcgaaa tttaatgtat ttccatctct	aatcagacag gacactatgg ggaactgaat	37560
aagtgatttt aaaagtcctg gaaaattaat	aactgagaat aacctgaaa agtatgaaaa	37620
aaggagacaa atgaattgct ccaacagata	tcagaacgct aaattataat aaaaatacta	37680
ctaggataag aaaatacata tactgatgta	atgaataaag aatccagaat tagattccag	37740
taagtcaaac tactttacta taaaccaggg	gtggcatatt catccagtgg gaaaaggaca	37800
gtaagaagtg agtaaaactat ggcccactgg	ccaaattgtg gcctctgcct atttttgc	37860
ataaagtgtt actgggacaa agccaagcct	atcatttgca aattgtctat aaatatcttc	37920
atgttacaga atcacacagt ttcaacagag	accatcttgt ctacaaagct gaaaatatct	37980
actatctggc ccttgagaa agtttgccaa	accttagttt atataataa agatcagcta	38040
tgtcatagac acctatctca cacaacacat	tggtggaaag gaccttcttt ttttttgag	38100
acggggctct gctctgttga ccaggctgga	ctgtagtggc atgatcatgg ctactgcag	38160
cctcaacctc ccagggttcaa gtaatgctcc	caccacagaa tcccaaaccg ctgggagaga	38220
tgtgtgccac tacgcctggc taaggggcct	ttttaacaga gaaagaaat cacatactac	38280
taagaaaaag aagggcata tttgatata	tttatatttt ttatatagat atcataaaaa	38340
ccaagatgaa ttatacagtt atattttgca	atgtgtttga cggtaaaagt ttaatatcta	38400
ctaaaaattat tttataaaat atctttaata	tatttataga tattataata taaaatatct	38460
ctaaaaattat tttataaaat aaaaagttaa	gaagaaaaga taggcaaaac aaaaatacgt	38520
gcaatttaca gaaaaccaag tccaaatggt	caacaaagat aaaacagatt tataaactca	38580
ctaagtgtga gagaattatt agttaaaagta	aaaatatctc tctataccca caatactact	38640
aaaaatcaga gttataatgc cctattgctg	gtggagatgt aaggggagaa gcatgctctc	38700
atatactgtt agtgaaaatt taaactaata	catttttgaa aagtaagctg gcaatttttt	38760
ttttaatctc taccttttga tgcaaaaact	catttttggg tacctattcc ataccttaaa	38820
aaaaatacat atgcttactg tagtactgtt	tataatggta aaaactagaa aaaaagaaaa	38880
cttgatagtg aatactgaac aaattacagt	gcactctacag attaaacata atgcagccat	38940
taaaaaagaa taaattaggc tgggtgcggt	ggctcatgcc cgtaatccca gcactttggg	39000
aggccaaagc aggcggatca cttgaggcca	ggagtctgag accagcctgg ccaacatggc	39060
aaaacacctg ctctacaaaa aatacaaaaa	ttagtggggc atggtgtgtg gcacctgtag	39120
tccagctac tcaggaggct gaggcaggag	aatcaactga gcctgggaga cagagattgc	39180

agtgagccaa gatcatgcca cagcattcca gtccaggtga cagaacgaga ctctgtctca 39240
 acaaaaagaa caaatataac cctacaacto atcaacaaaa ataccacaa ccaattcaaa 39300
 aatggggcaa ggacttgaat agacatttct tcaaggatga taacaacaga catgaaaaga 39360
 tgcagagcac tattcattag tgattacato ccacatgcat taggatggct agtatgaaga 39420
 acagaaaaata ataaatatgt gtgaagatct gaaaaacaga aacctttgtg cactgttggt 39480
 gggaaatgtaa agtgggtacag ctactacgga aaacagtatg gccattcctc aagaaaaata 39540
 aaataaaaatt atcttatgat aggaatatgc atttctgggt aaatacccca aataactgaa 39600
 aacaggggtg acacccattt caacatttac atgtcaatto aactgggcca gaataccag 39660
 atatttggc aaatattctt ctggatgctt ctatatatat gttttttggc tgagggttaac 39720
 atttaaatgt gtggattctg agtacagcag attaccatcc acaatgtagg tgggcctcat 39780
 ctactcagtt gaaggtctta cagaaaaaga ctgacctccc ttgagcaaga aagaattcag 39840
 gcaacagact gcctttggac tcaactgcaa ctcttccttg agtcaacagc ccatcccatc 39900
 accttggtt ggtgagtcca gggctctgat aggtaggctg cagactcaag gaagagctgc 39960
 gaaaaccagg aaagccaatt cattaaaaa aatctctctc tacacaaaa cacacacaca 40020
 caccaccac caccatgatg gttctgttct tctggagaat gctaatacac cctgttcat 40080
 gcagcatta ttcacaatag ccaaaaggtg gaagcaactc cagcagatga atggagaagc 40140
 gaaatgtggt atgtatatat aatggaatat tattaagcct ttaaaaagt gaaattatat 40200
 ctatctatat ctatacacac atactcacac acacacacac acatttatag aagacagggt 40260
 caccatgt tgtcaaggct ggtctcgaa cctctggctc aagcaaacg cctgcctcag 40320
 tttcccaag tctgtgagatt acatgtgtga gccaccacac ccagccaaaa aaaggacatt 40380
 ctgacacata atacaatata gataaacaat gaggacatca tgatatgcga aataagcctg 40440
 tcacaaaaag gcaattagtg tatgattcct ctgtgtatg gtacctatgg atgtcaaatc 40500
 cataaagtag aatggggaaa cagagagttg ttaaatgggt atagagtttg ttttgcaaga 40560
 agaaaagagt tttggagaat gaatgtacaa cagtgtgaac ataattaaca ctactgaaaa 40620
 tggttaagat tataaatatt atgttacatt tattttacca tgattaaaaa ttaaaacaaa 40680
 ataattattaa gaaaaaatac tataaataac aacaacaaaa aaacacctc aagcaactta 40740
 cattcacctg ggaacagaa tacatcctat tctgctagag atatatctgc agttcaaaat 40800
 ttattacaaa tgatgtgtgt tatctttttg aaatgactga aaactaaat taaaagcaat 40860
 aatattcagt ttaactaaca gtaagtctt ctttcattgt tctgacttt ctgtgaagat 40920
 gttattgcaa gatatctact aaaatggaaa acaactgaaa aggcacaaat ataatttctt 40980
 atcaacatcg ctaaaacctt ggaggggaag aatcctaaca aacatggcca taatttgcca 41040

*Catattttcta ctgtcctcac ttttcaaat ccagaaatca acattttctgg aaacaaaaca 41100
 gagtctaaaa tttgctcct tttcagttt agaaggtgcc aagttaatcc ctgacatcct 41160
 agtttccatt ttcaaaaatg tactttttct ctccccaaac cggtatctag attcttaaat 41220
 atttttagca catagaagtt aaatagattt gcttaaccaa aatagccagt aaacctccca 41280
 aaagaattaa aatattaatg gcgctttaat gatacaaatg aacaacttta cattcaatcg 41340
 tcaatgggaa aggaagcaga attctgagga ttatgaaagt aaacaaaacg aagttcaaat 41400
 tctactttat tttacttttt tgtaactaat gaacaacttc ttccaaagac aagtaggaaa 41460
 taaaaaatt agccaggcat ggcacatgcc tgtagtctcg gttacttgga aggctgaagt 41520
 ggggtggatcg cttgagccgg gaaggcagag gctgtagtga gctgagatca catcactgca 41580
 ctcaagcctg ggtgacagag caagaccctc tctggggaaa aaaaaaaaaa aaataggctg 41640
 ggcgcagtggt ctacacactg taattccagc actttgggag gctgaggcag gtggttcacc 41700
 gaggtcagg agttctagac cagcctgacc aatatggtga aacctgtct ctactaaaaa 41760
 taaaaaatt agccaggcat ggtggtgggc aattgtaato ctactaactc gggaggctga 41820
 ggcaggaaaa tcgctggaac ccaagaggcg gaggtttcag tgagccgaga ttgcactagt 41880
 gactccagc cttggcgaca gagcaagact tcatctcaaa ataataaat aagtaagtaa 41940
 taaaaattaa aaaatatata aaaataaaac aaagataagt aggaaccatc cttttttttt 42000
 ttttttttt ttttttttaa agatagggtc tgtttctgat gccaggctt gagtgtagt 42060
 gatgatcat ggctcactgc aaccttgacc tctcaaatc aagtgactct cctacctcag 42120
 gctcccaagt agctgggact acaggtgctt accaccccat cgggctcatt taaaaaatt 42180
 ttttgtaga ggtgggtct cactatgttg tatccaggct ggtctcattt taactttatt 42240
 agaaaacaag cattgtttta tcagcttctt gtttttttaa aactaaaaat aacactgcta 42300
 ggtgtttct atgaagatcc tctaaattta ttataacct taagaataac atgtagaaca 42360
 aagtagatga ctgaatgac tttgttgaat aaatatgaat ggatattcaa ataattaa 42420
 atctcttaag atctcccat ctttacagga tacagagaaa actogttaat atggcctgac 42480
 tttaccttt gcagccttat ccaaactctg tggccaagac aaacaggttg tccttatact 42540
 tacaacgtcc cctttgcct acaaagctct tctcatgact ctttgctat cttaagttoa 42600
 cctatctgtc aaatctctgg gaatgcaaca tttctcaaag gtagccttct ctctcccaa 42660
 actagaacaa attctctcg ggcattagg tttttattgc actgtatgtc tottcttcac 42720
 agcaatcaca gttccaatgt tatatttga ttttagttg attgtttct ttccacctt 42780
 agactataac cttctaagg gtcacacata atatcgatca tcagttgtat ccttgtgtca 42840
 tagcacagg gcatggcagc aaatatgtgt gtaataaaac ttgttgaatg aatcaatgag 42900

acacacatttt cttaccocaaa gtataatggc aggataacat ttatcaatct attgcttctt 42960
gaaaaacaga tatgatgtgc ttaatttttca ttttcatct caaataccaa tgcctaagga 43020
attcacagtc atttttcaaaa tctttttgac aaatgccttc attaatcacc acctgtttac 43080
aagtgtctaaa taacattttg gttacattct gtaacatttc ctgcacttaa tgtcatctct 43140
agaatactgg ctaatatgaa gcacctggac ttcaggaaca caaacctgaa actaacacac 43200
caaaactaaa tgttatgtaa atgacagaaa tgacacattt tggctctgcaa catctctaga 43260
tggcttttgg accaattcaa cttttaccac taaaaatogg toacctgact atagtcatct 43320
tgagctcatg ataatgaat tacagatgaa aaataaatag tttgatgaca atctttacaa 43380
aagtttatct tcaaagaata ccaccagtc caggtattct aggtctctat caacttattt 43440
ggtcagggga gacttcaact ttcatgataa ttatgttctg aaaattctac aaacttaaty 43500
attacaacaa aaagtcatag ttgtctcata aatcaggcct aggtctggat tctagtctct 43560
cattttttca ttgttctact gaggcaagtg acttaaaatt ccctagcctc agtttctctca 43620
catgtaaaaa cagataatga ttctatttcc taagatgggt ttgagggttc aacaagataa 43680
gatgggcctc actcaagcat gtcagtact ctgtctctct ctctccgggt atgcagaaat 43740
ttattagga ttctgcgaag taaaataaat atttcagtaa aaattatgcc ctttattaat 43800
gatctagat tttoagattt tctttaaatt tacttagtaa cttagggtct caaatattat 43860
agagatttgt atctagtatt ttaaagaaat gaaagggtgt aatcaaaatg ctgcacaaat 43920
aatgtctaca tttaacaaac agaataatcc aaccatacaa actaatcaga tataaagaag 43980
taagcaacag aaatctgatg ttgcctttag atcacacaat taggcaacaa aaaatagagt 44040
tgcacatctc tttggctcaag gccatggttg aagactgaat accaaaatag gaaataggaa 44100
aagccaggaa atggcacaatt agcaaaaact ggactcctta atttttatat tcattttcat 44160
atctcacttc taaaacttta attaaattca aataaaaacc aaaatggaac tgagataaag 44220
ccaaaaggaa agttatgtag gtcaaatgag aacctatatt gtcccttaggc tctttgttgc 44280
tttctgttta aggaaaaact gcccaagtgc ctgacacat taaagatcaa gcaggagggt 44340
ctgccgagag tccccatctg gcagccaggt tttgtcaagc aaatttttag aattctctac 44400
cctcccaact tctatctaat tatagcactt tataaaaacc attctctctc tgtctctgtc 44460
tctctctctc tctctctctc acacacacac acacacacac acacacacac 44520
tttctctctc tctctctctg aaacttatct gtattataat aacacacac taggtatgga 44580
ttaatctgac aattttcccc taaaacagaa taaattcaaa aaggaaaacc tttcctctgt 44640
acacatgcac tatattctga caataataat tcctaaatta agtataatc attttcccta 44700
caggagttaa aagaagttac agtaaaagt ctcttgatata aatatatatg ccagaacttg 44760

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525
 526
 527
 528
 529
 530
 531
 532
 533
 534
 535
 536
 537
 538
 539
 540
 541
 542
 543
 544
 545
 546
 547
 548
 549
 550
 551
 552
 553
 554
 555
 556
 557
 558
 559
 560
 561
 562
 563
 564
 565
 566
 567
 568
 569
 570
 571
 572
 573
 574
 575
 576
 577
 578
 579
 580
 581
 582
 583
 584
 585
 586
 587
 588
 589
 590
 591
 592
 593
 594
 595
 596
 597
 598
 599
 600
 601
 602
 603
 604
 605
 606
 607
 608
 609
 610
 611
 612
 613
 614
 615
 616
 617
 618
 619
 620
 621
 622
 623
 624
 625
 626
 627
 628
 629
 630
 631
 632
 633
 634
 635
 636
 637
 638
 639
 640
 641
 642
 643
 644
 645
 646
 647
 648
 649
 650
 651
 652
 653
 654
 655
 656
 657
 658
 659
 660
 661
 662
 663
 664
 665
 666
 667
 668
 669
 670
 671
 672
 673
 674
 675
 676
 677
 678
 679
 680
 681
 682
 683
 684
 685
 686
 687
 688
 689
 690
 691
 692
 693
 694
 695
 696
 697
 698
 699
 700
 701
 702
 703
 704
 705
 706
 707
 708
 709
 710
 711
 712
 713
 714
 715
 716
 717
 718
 719
 720
 721
 722
 723
 724
 725
 726
 727
 728
 729
 730
 731
 732
 733
 734
 735
 736
 737
 738
 739
 740
 741
 742
 743
 744
 745
 746
 747
 748
 749
 750
 751
 752
 753
 754
 755
 756
 757
 758
 759
 760
 761
 762
 763
 764
 765
 766
 767
 768
 769
 770
 771
 772
 773
 774
 775
 776
 777
 778
 779
 780
 781
 782
 783
 784
 785
 786
 787
 788
 789
 790
 791
 792
 793
 794
 795
 796
 797
 798
 799
 800
 801
 802
 803
 804
 805
 806
 807
 808
 809
 810
 811
 812
 813
 814
 815
 816
 817
 818
 819
 820
 821
 822
 823
 824
 825
 826
 827
 828
 829
 830
 831
 832
 833
 834
 835
 836
 837
 838
 839
 840
 841
 842
 843
 844
 845
 846
 847
 848
 849
 850
 851
 852
 853
 854
 855
 856
 857
 858
 859
 860
 861
 862
 863
 864
 865
 866
 867
 868
 869
 870
 871
 872
 873
 874
 875
 876
 877
 878
 879
 880
 881
 882
 883
 884
 885
 886
 887
 888
 889
 890
 891
 892
 893
 894
 895
 896
 897
 898
 899
 900
 901
 902
 903
 904
 905
 906
 907
 908
 909
 910
 911
 912
 913
 914
 915
 916
 917
 918
 919
 920
 921
 922
 923
 924
 925
 926
 927
 928
 929
 930
 931
 932
 933
 934
 935
 936
 937
 938
 939
 940
 941
 942
 943
 944
 945
 946
 947
 948
 949
 950
 951
 952
 953
 954
 955
 956
 957
 958
 959
 960
 961
 962
 963
 964
 965
 966
 967
 968
 969
 970
 971
 972
 973
 974
 975
 976
 977
 978
 979
 980
 981
 982
 983
 984
 985
 986
 987
 988
 989
 990
 991
 992
 993
 994
 995
 996
 997
 998
 999
 1000
 1001
 1002
 1003
 1004
 1005
 1006
 1007
 1008
 1009
 1010
 1011
 1012
 1013
 1014
 1015
 1016
 1017
 1018
 1019
 1020
 1021
 1022
 1023
 1024
 1025
 1026
 1027
 1028
 1029
 1030
 1031
 1032
 1033
 1034
 1035
 1036
 1037
 1038
 1039
 1040
 1041
 1042
 1043
 1044
 1045
 1046
 1047
 1048
 1049
 1050
 1051
 1052
 1053
 1054
 1055
 1056
 1057
 1058
 1059
 1060
 1061
 1062
 1063
 1064
 1065
 1066
 1067
 1068
 1069
 1070
 1071
 1072
 1073
 1074
 1075
 1076
 1077
 1078
 1079
 1080
 1081
 1082
 1083
 1084
 1085
 1086
 1087
 1088
 1089
 1090
 1091
 1092
 1093
 1094
 1095
 1096
 1097
 1098
 1099
 1100
 1101
 1102
 1103
 1104
 1105
 1106
 1107
 1108
 1109
 1110
 1111
 1112
 1113
 1114
 1115
 1116
 1117
 1118
 1119
 1120
 1121
 1122
 1123
 1124
 1125
 1126
 1127
 1128
 1129
 1130
 1131
 1132
 1133
 1134
 1135
 1136
 1137
 1138
 1139
 1140
 1141
 1142
 1143
 1144
 1145
 1146
 1147
 1148
 1149
 1150
 1151
 1152
 1153
 1154
 1155
 1156
 1157
 1158
 1159
 1160
 1161
 1162
 1163
 1164
 1165
 1166
 1167
 1168
 1169
 1170
 1171
 1172
 1173
 1174
 1175
 1176
 1177
 1178
 1179
 1180
 1181
 1182
 1183
 1184
 1185
 1186
 1187
 1188
 1189
 1190
 1191
 1192
 1193
 1194
 1195
 1196
 1197
 1198
 1199
 1200
 1201
 1202
 1203
 1204
 1205
 1206
 1207
 1208
 1209
 1210
 1211
 1212
 1213
 1214
 1215
 1216
 1217
 1218
 1219
 1220
 1221
 1222
 1223
 1224
 1225
 1226
 1227
 1228
 1229
 1230
 1231
 1232
 1233
 1234
 1235
 1236
 1237
 1238
 1239
 1240
 1241
 1242
 1243
 1244
 1245
 1246
 1247
 1248
 1249
 1250
 1251
 1252
 1253
 1254
 1255
 1256
 1257
 1258
 1259
 1260
 1261
 1262
 1263
 1264
 1265
 1266
 1267
 1268
 1269
 1270
 1271
 1272
 1273
 1274
 1275
 1276
 1277
 1278
 1279
 1280
 1281
 1282
 1283
 1284
 1285
 1286
 1287
 1288
 1289
 1290
 1291
 1292
 1293
 1294
 1295
 1296
 1297
 1298
 1299
 1300
 1301
 1302
 1303
 1304
 1305
 1306
 1307
 1308
 1309
 1310
 1311
 1312
 1313
 1314
 1315
 1316
 1317
 1318
 1319
 1320
 1321
 1322
 1323
 1324
 1325
 1326
 1327
 1328
 1329
 1330
 1331
 1332
 1333
 1334
 1335
 1336
 1337
 1338
 1339
 1340
 1341
 1342
 1343
 1344
 1345
 1346
 1347
 1348
 1349
 1350
 1351
 1352
 1353
 1354
 1355
 1356
 1357
 1358
 1359
 1360
 1361
 1362
 1363
 1364
 1365
 1366
 1367
 1368
 1369
 1370
 1371
 1372
 1373
 1374
 1375
 1376
 1377
 1378
 1379
 1380
 1381
 1382
 1383
 1384
 1385
 1386
 1387
 1388
 1389
 1390
 1391
 1392
 1393
 1394
 1395
 1396
 1397
 1398
 1399
 1400
 1401
 1402
 1403
 1404
 1405
 1406
 1407
 1408
 1409
 1410
 1411
 1412
 1413
 1414
 1415
 1416
 1417
 1418
 1419
 1420
 1421
 1422
 1423
 1424
 1425
 1426
 1427
 1428
 1429
 1430
 1431
 1432
 1433
 1434
 1435
 1436
 1437
 1438
 1439
 1440
 1441
 1442
 1443
 1444
 1445
 1446
 1447
 1448
 1449
 1450
 1451
 1452
 1453
 1454
 1455
 1456
 1457
 1458
 1459
 1460
 1461
 1462
 1463
 1464
 1465
 1466
 1467
 1468
 1469
 1470
 1471
 1472
 1473
 1474
 1475
 1476
 1477
 1478
 1479
 1480
 1481
 1482
 1483
 1484
 1485
 1486
 1487
 1488
 1489
 1490
 1491
 1492
 1493
 1494
 1495
 1496

caggtagtaa agagagctca ctaaaatacc aattaggcta aaaacaggag gtaaagaaat 240
 aatcaaatca tctatcgct gagagcacag ggggaggac aatgatcggg atataaaccc 300
 aggcatttga gccagatcag gtaacctct ttgggtcccc tcacctgta tgggagctct 360
 gttttcactc tattaatct tgcaactgca cactcttctg gtccatgttt gtccggctc 420
 aagctgagct tttgtcgcg gtccaccact gctgaatgcc gccattgcag acctgccctt 480
 gacttccacc cctccggatc cggcagagtg tccgctgcac tctgatcca gcgaggcacc 540
 cattgccact ccgatcagg ctaaaggctt gccattgttc ctgcacagct aagtgcctgg 600
 gttcatccta atcaggctga aactgggtcg ctgggttcca cggttctctt ccatgactca 660
 cagcttctaa tagagctata aactcacca catggcccaa ggttccattc gttggaatcc 720
 atgaggccaa gaacccagg tcagagaata aaaggccgc cccattctgg gag 773

<210> 68 <211> 10 <212> PRT <213> Homo sapiens <400> 68

Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val
 5 10

<210> 69 <211> 10 <212> PRT <213> Homo sapiens <400> 69

Leu Leu Phe Gly Pro Cys Ile Phe Asn Leu
 5 10

<210> 70 <211> 10 <212> PRT <213> Homo sapiens <400> 70

Cys Leu Pro Leu Asn Phe Arg Pro Tyr Val
 5 10

<210> 71 <211> 10 <212> PRT <213> Homo sapiens <400> 71

Gly Leu Leu Ser Gln Trp Met Pro Trp Ile
 1 5 10

<210> 72 <211> 9 <212> PRT <213> Homo sapiens <400> 72

Cys Leu Pro Ser Gly Ile Phe Phe Val
 1 5

<210> 73 <211> 9 <212> PRT <213> Homo sapiens <400> 73

Trp Met Pro Trp Ile Leu Pro Phe Leu
 1 5

<210> 74 <211> 10 <212> PRT <213> Homo sapiens <400> 74

Ile Arg Trp Val Thr Pro Pro Thr Gln Ile
 1 5 10

<210> 75 <211> 10 <212> PRT <213> Homo sapiens <400> 75
 Leu Arg Asn Thr Gly Pro Trp Gly Leu Leu
 1 5 10

<210> 76 <211> 10 <212> PRT <213> Homo sapiens <400> 76
 Leu Arg Thr His Thr Arg Leu Val Ser Leu
 1 5 10

<210> 77 <211> 10 <212> PRT <213> Homo sapiens <400> 77
 Lys Arg Val Pro Ile Leu Pro Phe Val Ile
 1 5 10

<210> 78 <211> 10 <212> PRT <213> Homo sapiens <400> 78
 Cys Arg Cys Met Thr Ser Ser Ser Pro Tyr
 1 5 10

<210> 79 <211> 10 <212> PRT <213> Homo sapiens <400> 79
 Thr Arg Val His Gly Thr Ser Ser Pro Tyr
 1 5 10

<210> 80 <211> 10 <212> PRT <213> Homo sapiens <400> 80
 Ala Arg Glu Lys His Val Lys Glu Val Ile
 1 5 10

<210> 81 <211> 10 <212> PRT <213> Homo sapiens <400> 81
 Ser Arg Ile Glu Ala Val Lys Leu Gln Met
 1 5 10

<210> 82 <211> 10 <212> PRT <213> Homo sapiens <400> 82
 Ser Gln Trp Met Pro Trp Ile Leu Pro Phe
 1 5 10

<210> 83 <211> 9 <212> PRT <213> Homo sapiens <400> 83
 Cys Tyr Tyr Val Asn Gln Ser Gly Ile
 1 5

<210> 84 <211> 9 <212> PRT <213> Homo sapiens <400> 84
 Phe Tyr Tyr Lys Leu Ser Gln Glu Leu
 1 5

<210> 85 <211> 9 <212> PRT <213> Homo sapiens <400> 85

Thr Tyr Thr Thr Asn Ser Gln Cys Ile
1 5

<210> 86 <211> 9 <212> PRT <213> Homo sapiens <400> 86

Ser Phe Leu Val Pro Pro Met Thr Ile
1 5

<210> 87 <211> 9 <212> PRT <213> Homo sapiens <400> 87

Tyr Tyr Val Asn Gln Ser Gly Ile Val
1 5

<210> 88 <211> 9 <212> PRT <213> Homo sapiens <400> 88

Leu Phe Asn Thr Thr Leu Thr Gly Leu
1 5

<210> 89 <211> 9 <212> PRT <213> Homo sapiens <400> 89

Leu Phe Gly Pro Cys Ile Phe Asn Leu
1 5

<210> 90 <211> 9 <212> PRT <213> Homo sapiens <400> 90

Arg Trp Val Thr Pro Pro Thr Gln Ile
1 5

<210> 91 <211> 10 <212> PRT <213> Homo sapiens <400> 91

Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile
1 5 10

<210> 92 <211> 10 <212> PRT <213> Homo sapiens <400> 92

Leu Pro Tyr His Ile Phe Leu Phe Thr Val
1 5 10

<210> 93 <211> 10 <212> PRT <213> Homo sapiens <400> 93

Gly Ala Leu Gly Thr Gly Ile Gly Gly Ile
1 5 10

<210> 94 <211> 10 <212> PRT <213> Homo sapiens <400> 94

Leu Pro Phe Val Ile Gly Ala Gly Val Leu
1 5 10

<210> 95 <211> 9 <212> PRT <213> Homo sapiens <400> 95

Arg Arg Pro Leu Asp Arg Pro Ala Ser
1 5

<210> 96 <211> 9 <212> PRT <213> Homo sapiens <400> 96
 Phe Arg Pro Tyr Val Ser Ile Pro Val
 1 5

<210> 97 <211> 9 <212> PRT <213> Homo sapiens <400> 97
 Arg Arg Ala Leu Asp Leu Leu Thr Ala
 1 5

<210> 98 <211> 9 <212> PRT <213> Homo sapiens <400> 98
 Trp Arg Met Gln Arg Pro Gly Asn Ile
 1 5

<210> 99 <211> 10 <212> PRT <213> Homo sapiens <400> 99
 Asp Arg Ile Gln Arg Arg Ala Glu Glu Leu
 5 10

<210> 100 <211> 10 <212> PRT <213> Homo sapiens <400> 100
 Leu Arg Thr His Thr Arg Leu Val Ser Leu
 5 10

<210> 101 <211> 10 <212> PRT <213> Homo sapiens <400> 101
 Glu Arg Val Ala Asp Ser Leu Val Thr Leu
 5 10

<210> 102 <211> 10 <212> PRT <213> Homo sapiens <400> 102
 Leu Phe Gly Pro Cys Ile Phe Asn Leu Leu
 1 5 10

<210> 103 <211> 10 <212> PRT <213> Homo sapiens <400> 103
 Gln Phe Tyr Tyr Lys Leu Ser Gln Glu Leu
 1 5 10

<210> 104 <211> 10 <212> PRT <213> Homo sapiens <400> 104
 Gln Trp Met Pro Trp Ile Leu Pro Phe Leu
 1 5 10

<210> 105 <211> 10 <212> PRT <213> Homo sapiens <400> 105
 Cys Tyr Tyr Val Asn Gln Ser Gly Ile Val
 1 5 10

<210> 106 <211> 10 <212> PRT <213> Homo sapiens <400> 106

Asn Phe Val Ser Ser Arg Ile Glu Ala Val
1 5 10

<210> 107 <211> 9 <212> PRT <213> Homo sapiens <400> 107

Gly Pro Leu Val Ser Asn Leu Glu Ile
1 5

<210> 108 <211> 9 <212> PRT <213> Homo sapiens <400> 108

Leu Pro Leu Asn Phe Arg Pro Tyr Val
1 5

<210> 109 <211> 10 <212> PRT <213> Homo sapiens <400> 109

Leu Pro Phe Leu Gly Pro Leu Ala Ala Ile
1 5 10

<210> 110 <211> 10 <212> PRT <213> Homo sapiens <400> 110

Glu Pro Lys Met Gln Ser Lys Thr Lys Ile
1 5 10

<210> 111 <211> 10 <212> PRT <213> Homo sapiens <400> 111

Leu Pro Tyr His Ile Phe Leu Phe Thr Val
1 5 10

<210> 112 <211> 9 <212> PRT <213> Homo sapiens <400> 112

Arg Glu Lys His Val Lys Glu Val Ile
1 5

<210> 113 <211> 10 <212> PRT <213> Homo sapiens <400> 113

Lys Pro Arg Asn Lys Arg Val Pro Ile Leu
1 5 10

<210> 114 <211> 9 <212> PRT <213> Homo sapiens <400> 114

Val Val Leu Gln Asn Arg Arg Ala Leu
1 5

<210> 115 <211> 10 <212> PRT <213> Homo sapiens <400> 115

Ala Val Val Leu Gln Asn Arg Arg Ala Leu
1 5 10

<210> 116 <211> 9 <212> PRT <213> Homo sapiens <400> 116

Leu Pro Phe Val Ile Gly Ala Gly Val
1 5

<210> 117 <211> 9 <212> PRT <213> Homo sapiens <400> 117

Asp Leu Tyr Ser Tyr Val Ile Ser Lys
1 5

<210> 118 <211> 10 <212> PRT <213> Homo sapiens <400> 118

Thr Glu Gln Asp Leu Tyr Ser Tyr Val Ile
1 5 10

<210> 119 <211> 2615 <212> DNA <213> Homo sapiens <400> 119	
gaattccggg aagccagacg gttaacacag acaaagtgtc gccgtgacac tcggccctcc	60
agtgttgccg agaggcaaga gcagcgaccg cgcacctgtc cgcccgagc tgggacgcgc	120
gcccgggcgg ccgagcaaga caggaggga cgcgcaggc tgcctccaa tgtaactcca	180
gcactgtgag gtttcaggga ttggcagagg ggaccaaggg gacatgaaa tggacatgga	240
ggatgcggat atgactctgt ggacagagc tgagtgtgaa gagaagtgt catacattgt	300
gacagaccac ccctgggatt ctggtgctga tggcgttact tcggttcagg cggaggcatc	360
ctaccaagg aatctgcttt tcaagtatgc caccaacagt gaagagggtta ttggagtgtat	420
ggttaaagaa tacataccaa agggcacacg ttttgaccc ctaatagggt aaatctacac	480
catgacaca gttcctaaga acgccaacag gaaatatttt tggaggatct attccagagg	540
gagcttcac cacttcattg acggctttaa tgaagagaaa agcaactgga tgcgctatgt	600
gaatccagca cactctcccc gggagcaaaa cctggctgcg tgcagaacg ggatgaacat	660
ctacttctac accattaagc ccattccctg caaccaggaa cttcttgtgt ggtattgtcg	720
ggaacttgcg gaaaggcttc actaccctta tcccggagag ctgacaatga tgaatctcac	780
acaaacacag agcagtctaa agcaaccgag cactgagaaa aatgaactct gcccaaagaa	840
tgtcccaaag agagagtaca cgtgaaaga aatcctaaaa ttggactcca acccctccaa	900
aggaaaggac ctctaccgtt ctaacatttc acccctcaca tcagaaaagg acctcgatga	960
ctttagaaga cgtggggagc ccgaaatgcc cttctacct cgggtcggtt acccctccg	1020
ggccctctg ccagaagact tttgaaagc ttccctggcc tacgggatcg agagaccac	1080
gtacatcact cgctccccc ttccatcttc caccactcca agccctctg caagaagcag	1140
ccccgaccaa agctctaaga gctccagccc tcacagcagc cctgggaata cgggtgtccc	1200
tgtgggcccc ggctctcaag agcaccggga ctcctaogct tactgaaag cgtctacag	1260
cacggaaggt ttgggtctct accctggcta cgcacccctg cccacctcc cgcagcttt	1320
catccctcg tacaacgctc actaccccaa gttctcttg cccctctacg gcatgaattg	1380
taatggcctg agcgcgtgtg gcagcatgaa tggcatcaac aactttggcc tcttcccgag	1440

gctgtgccct gtctacagca atctctcgg tgggggcagc ctgccccacc ccatgtctcaa 1500
 ccccaattct ctcccgagct cgtgcccctc agatggagcc cggagggtgc tccagccgga 1560
 gcatcccagg gaggtgcttg tcccggcgcc ccacagtgcc ttctctctta cgggggcgcg 1620
 cgccagcatg aaggacaagg cctgtagccc cacaagcggg tctcccacgg cgggaacagc 1680
 cgccaacggca gaacatgttg tgcagcccaa agctacctca gcagcgatgg cagccccag 1740
 cagcgacgaa gccatgaatc tcattaaaaa caaaagaaac atgaccggct acaagaccct 1800
 tccttaccog ctgaagaagc agaacggcaa gatcaagtac gaatgcaacg ttgtgcgcaa 1860
 gactttcggc cagctctcca atctgaaggt ccacctgaga gtgcacagtg gagaacggcc 1920
 tttcaaagt cagacttgca acaagggtct tactcagctc gccacctgc agaaacacta 1980
 cctggtacac acggggagaaa agccacatga atgccaggtc tgccacaaga gatttagcag 2040
 caccagcaat ctcaagacc acctgcgact ccattctgga gagaacccat accaatgcaa 2100
 gctgtgccct gccaaagtca ccagtttgt gcacctgaaa ctgcacaagc gtctgcacac 2160
 cggggagcgg ccccaacaag gctccagtg ccacaagaac tacatccatc tctgtagcct 2220
 caggtttcac ctgaaaggga actgcgctgc ggccccggcg cctgggctgc ctttgaaga 2280
 ctgacccga atcaatgaag aaatcgagaa gtttgacatc agtgacaatg ctgaccggct 2340
 caggagcgtg gaggatgaca tcagtgtgat ctctgtagtg gagaaggaaa ttctggccgt 2400
 ctacagaaaa gagaagaag aaactggcct gaaagtgtct ttgcaaagaa acatggggaa 2460
 tggactcttc tctcagggt gcagccttta tgagtcatca gatctacccc tcatgaagtt 2520
 gctcccagc aaccactac ctctggtacc tgtaaaggtc aaacaagaaa cagttgaacc 2580
 aatggatcct taagattttc agaaaacact tatatt 2615

<210> 120 <211> 29 <212> PRT <213> Homo sapiens <400> 120

Leu Gln Asn Arg Arg Ala Leu Asp Leu Leu Thr Ala Glu Arg Gly Gly
 1 5 10 15

Thr Cys Leu Phe Leu Gly Glu Glu Cys Cys Tyr Tyr Val
 20 25

<210> 121 <211> 21 <212> DNA <213> Homo sapiens <400> 121
 cttcaacaaa caaccaggag g

21

<210> 122 <211> 20 <212> DNA <213> Homo sapiens <400> 122
 ttggggagggt tggccgacga

20